UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

APR 28 1995

MEMORANDUM FOR: Distribution*

FROM: for Donald J. Leedy
George H. Darcy
Chief, Plans and Regulations Division

SUBJECT: Fishery Management Plan for the Scallop Fishery off Alaska (FMP)

Attached are the subject fishery management plan and associated documents prepared by the North Pacific Fishery Management Council for formal review under the Magnuson Fishery Conservation and Management Act (Magnuson Act). The FMP would authorize an interim closure of Federal waters to fishing for scallops for up to a 1-year period. The interim closure is necessary to prevent overfishing of scallop stocks during the period of time an alternative fishery management plan is developed that would allow the controlled harvest of scallops in Federal waters.

Please provide your comments (including "no comment") by June 16, 1995. If you have any questions, please call Bill Chappell at (301) 713-2341.

Attachments

* Distribution

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FISHERY MANAGEMENT PLAN
for the
SCALLOP FISHERY OFF ALASKA

Prepared by staff of the
National Marine Fisheries Service
North Pacific Fishery Management Council
Alaska Department of Fish and Game

April 1995

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1.0 INTRODUCTION

1.1 Scallop Management Background

The scallop resource off Alaska has been commercially exploited for almost 30 years. Weathervane scallop stocks off Alaska were first commercially explored by a few vessels in 1967. The fishery grew rapidly over the next 2 years with about 19 vessels harvesting almost 2 million pounds of shucked meat. Since then vessel participation and harvests have fluctuated greatly, but have remained below the peak participation and harvests experienced in the late 1960's. Between 1969 and 1991, about 40 percent of the annual scallop harvests came from State waters. Since 1991, Alaska scallop harvests have increasingly occurred in Federal waters. In 1994, only 14 percent of the 1.2 million lbs landed were harvested in State waters, with the remainder harvested in Federal waters off Alaska.

The State of Alaska has managed the scallop fishery in State and Federal waters, consistent with section 306(a)(3) of the Magnuson Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.)(Magnuson Act), which allows a state to directly regulate any fishing vessel outside state waters if the vessel is registered under the laws of that state. Until 1995, all vessels participating in the Alaska scallop fishery were registered under the laws of the State of Alaska and the fishery was monitored and controlled under State jurisdiction. The North Pacific Fishery Management Council (Council) concluded that the scallop management program implemented by the State provided sufficient conservation and management of the Alaska scallop resource and did not need to be duplicated by direct Federal regulation. Therefore, no Federal regulations were implemented to govern the scallop fishery in Federal waters.

The Council currently is considering options for a fishery management plan for the scallop fishery off Alaska that would authorize a moratorium on vessel entry into the fishery. A vessel moratorium cannot be implemented under Alaska State regulations given existing State statutes. At its April 1994 meeting, the Council requested NMFS to initiate rulemaking to implement a fishery management plan for the scallop fishery off Alaska that would establish a vessel moratorium and defer most other routine management measures to the State of Alaska. The Council was informed that section 306(a)(3) of the Magnuson Act prohibits a state from regulating a fishing vessel in Federal waters unless the vessel is registered under the laws of that state. As a result, routine management measures deferred to the State of Alaska under the Council's proposed management plan could not be applied in Federal waters to vessels not registered with the State. The Council recognized the potential problem of unregistered vessels fishing in Federal waters, but noted that all vessels fishing for scallops in Federal waters were registered under the laws of the State of Alaska. Therefore, the Council recommended that NMFS proceed with implementing the Council's proposed fishery management plan given that all vessels used to fish for scallops off Alaska had been registered with the State and that no information was available to indicate that vessels would not continue to register with the State.

During the period of time that NMFS was developing regulations to implement the Council's proposed management plan, the State of Alaska informed NMFS that a fishing vessel was fishing for scallops in Federal waters of the Prince William Sound management area closed by the State and that the vessel was not registered under the laws of the State. As a result, the vessel operator was not subject to State regulations governing the scallop fishery, including requirements to carry an observer at all times to monitor scallop catch and crab bycatch. The State could not stop this uncontrolled fishing activity because the vessel was not registered with the State of Alaska and was, therefore, operating outside the State's jurisdiction. On February 17, 1995, the Council held a teleconference to address concerns about uncontrolled fishing for scallops in Federal waters by one or more vessels fishing outside the jurisdiction of State regulations and requested that NMFS implement an emergency rule to close Federal waters to fishing for scallops to prevent overfishing of the scallop stocks. Subsequent to the Council's recommendation, the U.S. Coast Guard boarded the vessel fishing for scallops outside the jurisdiction of the State and was informed that 54,000 lbs of shucked scallop meat was on board. This amount exceeded the State's guideline harvest level for the Prince William Sound area (50,000 lbs) by over 100 percent.

NMFS implemented the emergency rule to close Federal waters off Alaska to fishing for scallops on February 23, 1995 (60 FR 11054, March 1, 1995) to respond to concerns that continued uncontrolled harvest of scallops in Federal waters would result in localized overfishing of the scallop resource. At its February 17, 1995, teleconference, the Council recommended that NMFS should extend the emergency rule for a second 90-day period, through August 28, 1995.

Based on recent events in the scallop fishery that warranted the emergency interim rule, the Council's proposed management plan no longer is an appropriate option for the management of the scallop fishery in Federal waters. Recent participation in the scallop fishery by at least one vessel fishing outside the jurisdiction of the State, contemplation by other vessel owners to fish in Federal waters outside State regulations governing the scallop fishery, and the likelihood that uncontrolled fishing for scallops could occur anywhere off Alaska by the highly mobile scallop processor fleet now requires that Federal regulations be implemented to control scallop fishing activity by vessels that choose not to register with the State of Alaska.

To respond to the need for Federal management of the scallop fishery once the emergency rule expires on August 28, 1995, the Council prepared the proposed Fishery Management Plan for the Scallop Fishery off Alaska (FMP) under section 303 of the Magnuson Act. The FMP would authorize an interim closure of Federal waters to fishing for scallops. The intent of the FMP is to prevent an unregulated and uncontrolled fishery for scallops in Federal waters that could result in overfishing of scallop stocks during the period of time an alternative fishery management plan is prepared that would authorize fishing for scallops under a Federal management regime. The Council pursued this approach because it determined that the suite of alternative management measures necessary to support a controlled fishery for scallops in Federal waters could not prepared, reviewed, and implemented before the emergency rule expires. Instead, the Council prepared the proposed FMP to protect the long-term productivity of scallops stocks off Alaska necessary to support the future harvest of optimum yield on a continuing basis without the "boom and bust" syndrome that other scallop fisheries historically have portrayed.

A description of the scallop fishery off Alaska, as well as harvest amounts and the number of vessels annually participating in the fishery is presented in Appendix A.

1.2 Description of the Management Area and Habitat

1.2.1 Geographic description of the management area

The management areas covered under the FMP includes all Federal waters of the Gulf of Alaska (GOA) and the Bering Sea/Aleutian Islands area (BSAI). The GOA is defined as the U.S. exclusive economic zone (EEZ) of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170°W longitude and Dixon Entrance at 132°40'W longitude. The BSAI is defined as the U.S. EEZ south of the Bering Strait to the Alaska Peninsula and Aleutian Islands and extending south of the Aleutian Islands west of 170° W long.

1.2.2 Physical habitat

The continental shelf parallels the southeastern Alaska coast and extends around the GOA. Total area of continental shelf in the GOA is about 160,000 square km, which is more than the shelf area in the Washington-California region but less than 25 percent of the eastern Bering Sea Shelf. Between Canada and Cape Spencer the Continental Shelf is narrow and rough. North and west of Cape Spencer it is broader. Although its width is less than 10 miles at some points, it is generally 30 to 60 miles wide. As it curves westerly from Cape Spencer towards Kodiak Island it extends some 50 miles seaward, making it the most extensive shelf area south of the Bering Sea. West of Kodiak Island and proceeding along the Alaska Peninsula toward the Aleutian Islands, the shelf gradually becomes narrow and rough again. More detailed information on the Alaskan shelf can be found in Sharma (1979).

Coastal waters overlying the continental shelf are subject to considerable seasonal influences. Winter cooling accompanied by turbulence and mixing due to major storms results in a uniform cold temperature in the upper 100 m. Seasonal changes in temperature and salinity diminish with increasing depth and distance from shore. Along the outer shelf and upper slope, bottom water temperatures of 4 to 5° C persist year-round throughout the periphery of the GOA. With further increase in depth, water temperature shows no significant seasonal change but gradually decreases with depth, reaching 2° C or less at greater depths. The water circulation pattern in both the eastern Bering Sea and Gulf of Alaska is a counterclockwise gyre (Sharma 1979). Inshore current flow patterns are affected by weather, tides, and topography.

All commercial fisheries for Alaskan scallops take place in relatively shallow waters (< 200 m) of the continental shelf. Weathervane scallops are found at depths ranging from intertidal waters to depths of 300 m (Foster 1991), but abundance tends to be greatest between depths of 45-130 m on substrates consisting of mud, clay, sand, or gravel (Hennick 1973). Although weathervane scallops are widely distributed along the shelf, the highest densities in Alaska have been found to occur in discrete areas. Areas fished during the 1993 scallop fishery included beds in the Bering Sea, off the Alaska Peninsula, in Shelikof Strait, on the east side of Kodiak Island, and along the Gulf coast from Yakutat to Kayak Island (Figure 1). Testimony from fishermen indicate that the Kodiak stocks are currently depressed.

The distribution of scallop beds is thought to be greatly affected by depth, bottom type, and ocean current patterns (NEFMC 1982). Variation in current patterns, along with other abiotic and biotic factors, likely affect local recruitment and distribution. The location of scallop beds depends on the speed and direction of those currents, as larvae are pelagic, and drift with the currents for several weeks before settling. Scallop beds tend to be elongated along the direction of current flow, and aggregations often represent different age or size groups (Caddy 1989; Robert and Jamieson 1986).

1.2.3 Benthic community

In both the Bering Sea and Gulf of Alaska, scallops are only a part of a diverse benthic community. Besides scallops, several other species of invertebrates are commercially harvested off Alaska, including clams, crabs, octopus, squid, and shrimp. Commercially important crab species include red king crab (Paralithodes camtschatica), blue king crab (P. platypus), brown or golden king crab (Lithodes aequispina), dungeness crab (Cancer magister), and two species of Tanner crab (Chionoectes bairdi, and C. opilio). Distribution of these species in the Bering Sea and Aleutian Islands is shown in Figure 2, and summarized by Otto (1981) and Lewbel (1983). Red king crabs are distributed from Southeast Alaska to Kodiak Island and northward into Norton Sound, with highest densities at depths of 40-100 meters. Blue king crabs also occur at those depths, but are distributed primarily around the Pribilof, St. Matthew, and St. Lawrence Islands. Tanner crabs occur at those depths, and deeper to 700 meters. C. opilio are distributed throughout the Bering Sea. C. bairdi, on the other hand, are distributed through the Gulf of Alaska and Aleutian Islands to the Bering Sea, with highest concentrations in the Bering Sea from the Alaska Peninsula to the Pribilof Islands. A summary of life history information for crabs is provided by Adams (1979), Somerton (1981), and Kessler (1985). Fisheries information for king and Tanner crabs can be found in the following references: Browning (1980), Otto (1981), and NPFMC (1989).

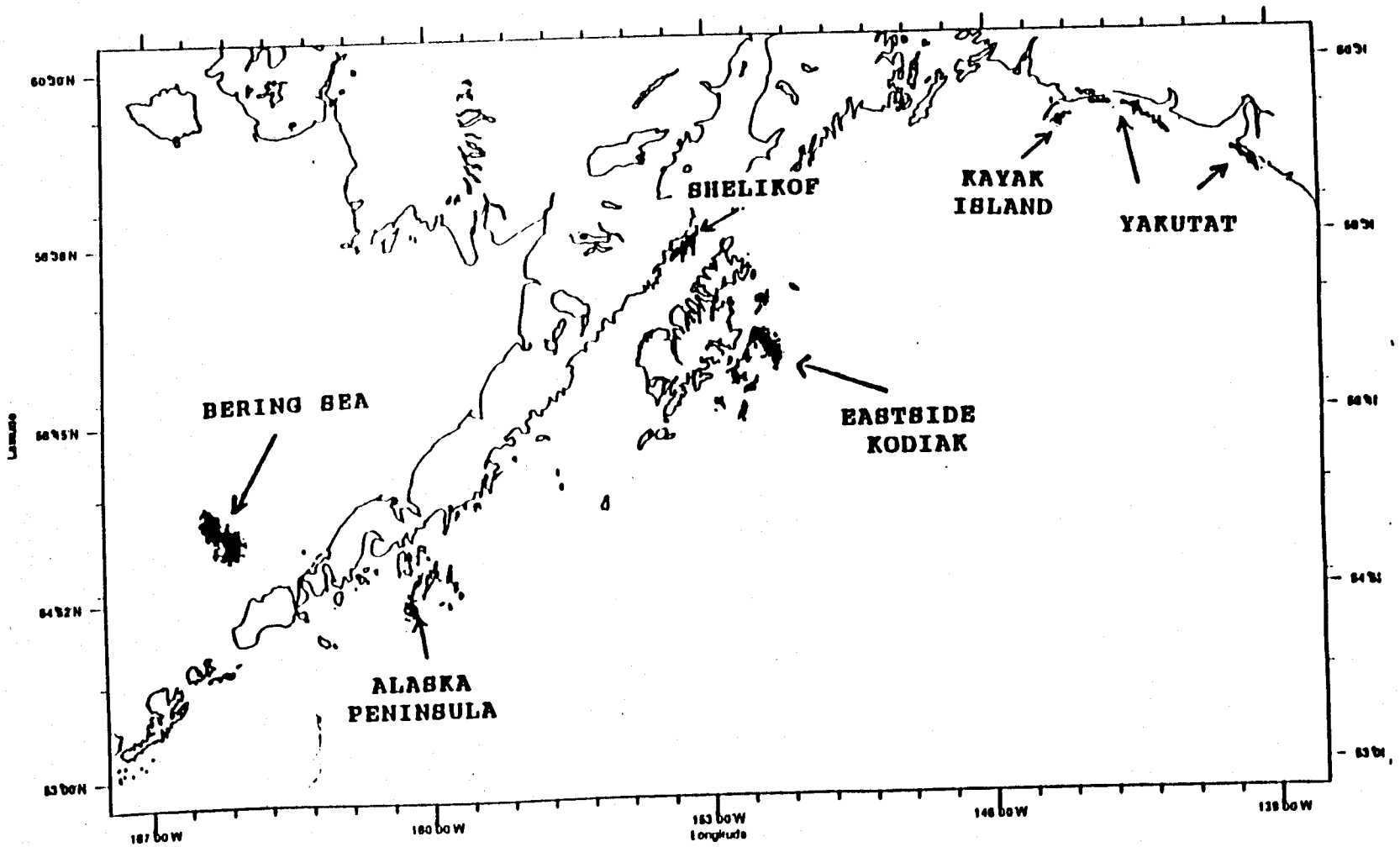


Figure 1 Areas fished statewide during the 1993 scallop fishery. Fishing in Southeast Alaska and parts of Dutch Harbor are remain confidential. From Urban et al. (1994).

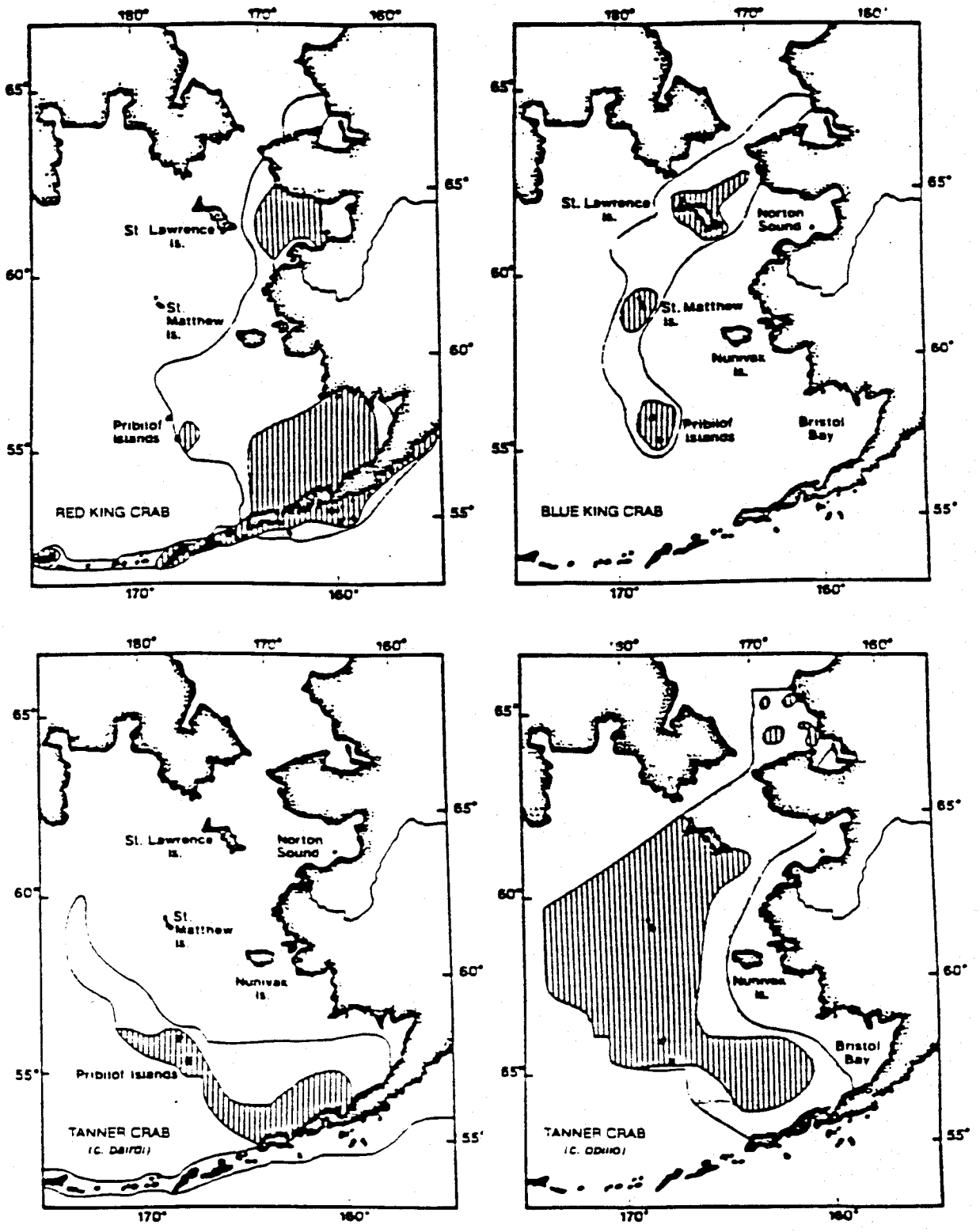


Figure 2 Distribution of king and Tanner crabs off the Bering Sea and Aleutian Islands. Areas of highest crab density are shown by vertical bars. From Otto (1981).

In addition to a crab fishery, there also large fisheries for groundfish using pot, longline, jig, and trawl gear. Fisheries for groundfish target walleye pollock (Theragra chalcogramma), Pacific cod (Gadus macrocephalus), lingcod (Ophiodon elongatus), sablefish (Anoplopoma fimbria) Atka mackerel (Pleorogrammus monopterygius), Pacific ocean perch (Sebastes alutus) and other rockfish species, and numerous species of flounder. In the Bering Sea yellowfin sole (Limanda aspera) dominates the flounder community, but is comparatively scarce in the Gulf and absent off Washington-California. The arrowtooth flounder, (Atheresthes stomias), is widely distributed along the Pacific and Bering Sea coasts of the United States and appears to comprise the largest part of the exploitable biomass of flounders in the Gulf of Alaska. Other abundant flounders in the Gulf include Pacific halibut (hippoglossus stenolepis), which reaches its greatest abundance there and off British Columbia; rocksole (Lepidopsette bilineata); starry flounder (Platichthys stellatus); flathead sole (Hippoglossoides elassodon); rex sole (Glyptocephalus zachirus); and, in deep water, Dover sole (Microstomus pacificus). Pacific salmon (Oncorhynchus sp.), and herring (Clupea pallasii) tend to be of a pelagic nature. A more complete description of commercial groundfish, other finfish, and shellfish stocks can be found in the Council's annual Stock Assessment and Fishery Evaluation report for the groundfish stocks (NPFMC 1994b) and several plan amendment analyses (e.g., Amendment 18/23, NPFMC, 1992).

Scallops also share the benthic habitat with non-economically important fish and invertebrate species. Non-commercial fishes include skates, sharks, sculpins, and numerous species of small fishes. Large invertebrates not usually commercially harvested generally include some crab and shrimp species, snails, clams, worms, jellyfish, seasquirts, bryozoans, sea urchins, seastars, sea anemones, sponges, corals, and many others. Various types of corals inhabit the Gulf of Alaska, including fan corals, bamboo corals, cup corals, soft corals, and hydrocorals (Cimberg et al. 1981). Generally, corals do not have the same habitat requirements as scallops and occur at greater depths than scallops. Two of the more abundant species in waters less than 100 fathoms are red tree (Primnoa wailleyi) and sea raspberry (Eunephtya sp). These species occur in areas of rugged habitat consisting of boulders and bedrock, habitats that are not inhabited by most scallop species.

1.2.4 Vulnerability to pollution

Scallop populations are vulnerable to pollution, even in offshore habitats where ocean dumping and runoff can have an effect (Gould and Fowler 1991). Ocean dumping of sediments may bury or damage scallops by abrasion and gill clogging (Larsen and Lee 1978). Nutrient loading can cause a low dissolved oxygen (hypoxic) conditions (Sindermann 1979), and an increase in bacterial infections (Leibovitz et al. 1984), or algal (Wassman and Ramus 1973) and dinoflagellate blooms (Shumway 1990), all of which can be detrimental to scallop populations. Naturally occurring toxins, such as that from the dinoflagellate Gonyaulax catenella, concentrate in exposed scallops, and incidence of paralytic shellfish poisoning (PSP) from eating scallops have been documented (Hudgins, 1981).

Scallops can also be affected by oil spills, via decreased gill respiration, but the effects are considered to be short-lived (Gould and Fowler 1991). Spiny scallops were found to be moderately sensitive to acute exposures (96 hour) to Cook Inlet crude and No. 2 fuel oil (Rice et al. 1979). Drilling muds are also of concern, in that they release sediments and heavy metals. Metals also are released by dumping, and municipal and industrial water discharges. Scallops are efficient at concentrating PCBs and heavy metals, including silver, copper, and nickel (Pesch et al. 1979), mercury (Klein and Goldberg 1970), cadmium (Vattuone et al. 1976), chromium (Mearns and Young 1977). At certain levels of concentration, heavy metals can be lethal or have adverse effects at lesser concentrations. Sublethal concentrations of copper produced substantial kidney and gonad damage in sea scallops, whereas cadmium induced hormonal changes such as early gonad maturation in sea scallops (Gould et al. 1985).

Because of their affinity for uptake of trace metals, sea scallops are readily contaminated in areas of ocean dumping making their marketable meats and gonads unacceptable for human consumption. Contamination of scallop beds by trace metals can cause adult scallop mortality and can affect the reproductive physiology of sea scallops, thus increasing the probability of poor recruitment (NEFMC 1993).

Measures to protect scallop habitat should be taken based on the concerns mentioned above. The dumping of dredge spoils, drilling muds, and municipal and industrial wastes should be minimized in areas of known scallop concentrations. Dispersal by water currents should also be taken into account when waste disposal and drilling sites are chosen.

1.3 Biological and Environmental Characteristics of the Resource

1.3.1 Description and distribution

The weathervane scallop (Patinopecten caurinus), is a bivalve and classified by having a single adductor muscle, a socket-like hinge, and distinct dorsal and ventral valves. Scallops have a limited swimming ability by utilizing hydraulic water pressure achieved by clapping the valves together. Numerous eyes, or ocelli, are located along the outer mantle on stalks. Scallops are non-burrowing filter feeders, subsisting primarily on phytoplankton.

Weathervane scallops are distributed from Point Reyes, California, to the Pribilof Islands, Alaska. The highest known densities in Alaska have been found to occur off Kodiak Island and along the eastern gulf coast from Cape Spencer to Cape St. Elias. Weathervane scallops are found from intertidal waters to depths of 300 m (Foster 1991), but abundance tends to be greatest between depths of 45-130 m on beds of mud, clay, sand, and gravel (Hennick 1973). Similar to patterns documented for other scallop species (Caddy 1989; Robert and Jamieson 1986), beds are elongated along the direction of current flow, and aggregations often represent different age or size groups.

Although the weathervane scallop has been the principal commercial species off Alaska, several other species of scallop found in the EEZ off Alaska have commercial potential. These scallops, thought to be closely related to the Icelandic scallops (Chlamys islandica) of the North Atlantic, grow to smaller sizes than weathervanes, and thus have not been extensively exploited in Alaska. Chlamys behringiana inhabit the Chukchi Sea to the Western Bering Sea. Chlamys albida are distributed from the Bering Sea and Aleutian Islands to the Japan Sea. Pink scallops, Chlamys rubida, range from California to the Pribilof Islands. Spiny scallops, Chlamys hastata, are found in coastal regions from California to the Gulf of Alaska.

Little is known about the biology of these scallop species. Chlamys species occupy different habitats and have different growth characteristics than weathervanes. Pink scallops are found in deep waters (to 200 m) in areas with soft bottom, whereas spiny scallops occur in shallower (to 150 m) areas characterized by hard bottom and strong currents. Spiny scallops grow to slightly larger sizes (75 mm) than pink scallops (60 mm). Both species mature at age 2, or about 35 mm, and are characterized by high natural mortality, with maximum age of about 6 years. Spiny scallops are autumn spawners (August-October), whereas pinks are winter spawners (January-March) (Bourne and Harbo 1987).

Rock scallops, Crassadoma gigantea, range from Mexico to Unalaska Island. The abundance of this species is not known, and a commercial fishery has never been developed. Because they attach themselves to rocks, trawls and dredges are not efficient in capturing rock scallops. As suggested by the species name, these scallops attain a large size (to 250 mm) and exhibit fast growth rates. Rock scallops are found in relatively shallower water (0-80 m) with strong currents. Apparently, distribution of these animals is discontinuous, and the abundance in most areas is low. Rock scallops may spawn during two distinct periods, one in the autumn (October -January), and one in the spring-summer (March-August) (Jacobsen 1977).

1.3.2 Reproduction and early life history

For weathervanes and the other scallop species, sexes are separate although one case of hermaphroditism in weathervanes has been observed (Hennick 1971). Mature male and female scallops are distinguishable: female gonads are pink or orange-red whereas gonads of males are white (Haynes and Powell 1968; Robinson and Breese 1984). Although spawning time varies with latitude and depth (Robinson and Breese 1984; MacDonald

and Bourne 1987; Starr and McCrae 1983), weathervane scallops in Alaska appear to mature in mid-December to late January and spawn in May to July depending on location (Hennick 1970a).

Scallops develop through egg, larval, juvenile, and adult life stages (Figure 3). Eggs and spermatozoa are released into the water, where the eggs become fertilized (Cragg and Crisp 1991). After a few days, eggs hatch, and larvae rise into the water column and drift with ocean currents. Larvae are pelagic and drift for about one month until metamorphosis to the juvenile stage (Bourne 1991). The "post-larvae" settle and attach to a hard surface on the bottom with strings called "byssal threads". Young juveniles may remain attached, or they may become mobile by use of a "foot", or they may swim. Within a few months the shell develops pigmentation, and juveniles then resemble the adult in appearance.

Weathervane scallops mature by age 3 at about 7.6 cm (3 inches) in shell height (SH), and virtually all scallops are mature by age 4 (Haynes and Powell 1968; Hennick 1970b, 1973). Growth is most rapid during the first 10-11 years (Hennick 1973). However, growth, maximum size, and size at maturity vary significantly within and between beds and geographic areas. For example, on average, maximum size as measured by (SH), tends to be about 190 mm (7.5 inches) SH for Marmot Flats off Kodiak Island and only 144 mm (5.7 inches) SH for the Cape Fairweather - Cape St. Elias area. The largest recorded specimen measured 250 mm (9.8 inches) SH and weighed 340 g (12 ounces, Hennick 1973). Although increasing with age and size, weight varies seasonally; meat yield declines during the spawning season and increases during the growing season. In addition, adductor weights of weathervane scallops apparently vary among regions, with the west side of Kodiak Island producing the largest meats relative to shell size.

1.3.3 Longevity and natural mortality

Weathervane scallops are long-lived; individuals may live 28 years old or more (Hennick 1973). The natural mortality rate (M) is thought to be low, although estimates vary. Based on a 28 year maximum life span, M is estimated to be 0.16 using Hoenig's (1983) equation. Similar estimates of mortality are obtained by applying catch curves to Hennick's (1973) data from the commercial fishery; resulting rates are 0.13, 0.16, 0.16 for Yakutat, westside Kodiak, and eastside Kodiak respectively (G. Kruse, ADF&G, personal communication). The Atlantic sea scallop, Placlopecten magellanicus, which exhibits a life history pattern similar to weathervanes, has a relatively low natural mortality rate, as M=0.10 (Medcof and Bourne 1964). Little is known about the causes of natural mortality for scallops. Scallops are likely prey to various fish and invertebrates during the early part of their life cycle. Flounders are known to prey on juvenile weathervane scallops, and seastars may also be important predators (Bourne 1991).

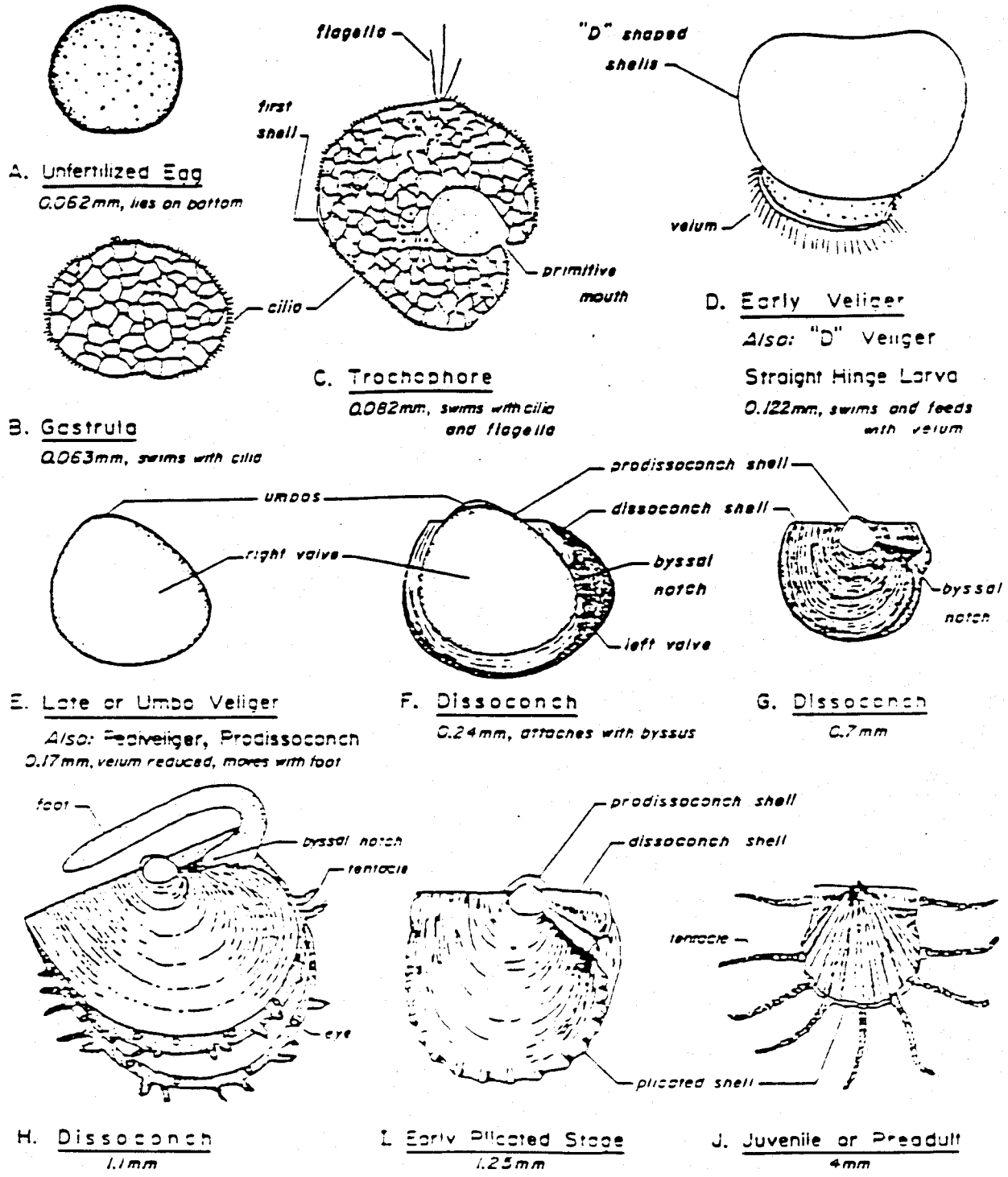


Figure 3 Larval and juvenile stages of the scallop. Bottom (right) valve is shown uppermost in E-J.

Source: Mottet 1979.

1.3.4 Stock structure and productivity

The stock structure of weathervane scallops has not been studied. Until recently, benthic ecologists generally believed that invertebrate species generally have "open" populations that are well-connected to other, geographically-distinct populations by advection of pelagic larvae. Growing evidence exists, however, that some invertebrate populations are actually comprised of multiple discrete, self-sustaining populations (Sinclair 1988; Orensanz et al. 1991). Sinclair et al. (1985) suggested that three species of scallops in the North Atlantic Ocean were comprised of a number of discrete, self-sustaining populations. From Virginia to Newfoundland, at least 19 discrete concentrations of Atlantic scallops may be self sustaining populations (Sinclair 1988). Fevolden (1989) provided strong evidence for restricted gene flow among different concentrations of Iceland scallop (Chlamys islandica) in the northeast Atlantic Ocean and concluded that scallops sampled from different areas of the northeast Atlantic Ocean should be treated as discrete genetic units for management purposes. Last, Caddy (1989) asserted that it is reasonable to assume that historically-maintained centers of scallop concentrations are self-sustaining populations. Further, he recommended that these commercially-important scallop beds should compose the unit stock upon which management measures are based. He also noted that a scallop fishing ground may contain several beds of high scallop density that are surrounded by a number of low-density scallop fishing areas.

Only limited information on biological productivity is available for weathervane scallops to promote the conservation of stocks and sustained yield of the fishery. Much of this information (Haynes and Powell 1968; Hennick 1970b, 1973) was collected during the early years of the fishery, but has been summarized more recently by Kaiser (1986). Although the fishery has been prosecuted every year since 1967 except 1978, the only assessment survey since 1972 was conducted in 1984 in lower Cook Inlet (Hammarstrom and Merritt 1985). Total scallop biomass in the Yakutat and Kodiak area ranged from 12,335 to 17,445 tons (Ronholt et al. 1977), but these estimates were based on inefficient shrimp trawls and were considered by Kaiser (1986) to be a minimum biomass estimate. A population of weathervanes in the Gulf Islands area of southern British Columbia was estimated to have a density of about 1 scallop per 65 square meters (Bourne 1991). In addition to a lack of good abundance estimates, there have been no routine biological or fishery sampling programs conducted on weathervane scallops. A new observer program, instituted in July 1993 by the State of Alaska, may provide better abundance information. The distribution of scallops in Alaskan waters is rather well-known, but insufficient information on abundance, exploitation rates, recruitment, and other key population dynamics parameters hampers fishery management based on population dynamics.

1.4 Alaska State Management of the Scallop Fishery

1.4.1 Current State management regime

The primary pectinid harvested off Alaska is the weathervane scallop (Patinopecten caurinus). Since the early 1980's, between 4 and 20 vessels annually have participated in the Alaska scallop fishery. Gross earnings experienced by the fleet during this same period of time has ranged from almost $.9 million in 1983 to about $7 million in 1992. Between 1969 and 1991, about 40 percent of the annual landings of scallops from waters off Alaska were comprised of scallops harvested from State waters. Since 1991, however, scallop harvests have increasing occurred in Federal waters. In 1994, only 14 percent of the scallop landing came from State waters, with the remainder harvested in Federal waters off Alaska (Table 1). The State of Alaska has managed the scallop fishery in State and Federal waters, consistent with section 306(a)(3) of the Magnuson Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.), which allows a state to directly regulate any fishing vessel outside state waters if the vessel is registered under the law of that state.

Table 1. Percentage of Alaska scallop landings from State (within 3 miles) and Federal waters (3-200 miles), by year from 1990 through 1994 (Ken Griffin, ADF&G, personal communication).

Year	State Waters	Federal waters
1990	46.9%	53.1%
1991	37.9%	62.1%
1992	73.6%	26.4%
1993	23.9%	76.1%
1994	13.7%	86.3%

The Alaska Department of Fish and Game (ADF&G) initiated development of a management plan for the scallop fishery in response to overfishing concerns resulting from recent changes in the weathervane scallop fishery off Alaska. Weathervane scallops possess biological traits (e.g., longevity, low natural mortality rate, and variable recruitment) that render them vulnerable to overfishing. Record landings occurred in the late 1960's (about 1.8 million pounds shucked scallop meat), followed by a significant decline in catch through the 1970's and 1980's when landed catch ranged between 0.2 and 0.9 million pounds. The ADF&G believes this decline is due, in part, to reduced abundance of scallop stocks (Kruse, 1994). Landings since 1989 have increased to near record levels. During this period, the number of vessels fishing for scallops has not increased (about 10 - 15 vessels annually), although an increase in fishing power is evidenced by a substantial increase in average vessel length (from 84 feet registered length in 1981 to 110 feet in 1991), a predominance of full-time scallop vessels, and an increased number of deliveries. Until 1993, the State did not have a data collection program, although some indication exists that overfishing, or at least localized depletion may have occurred. Data voluntarily submitted by participants in the scallop fishery during the early 1990's showed that an increase in meat counts per pound has occurred, indicating that smaller scallops now account for a greater proportion of the harvest. These data also suggest that catch per unit of effort in traditional fishing grounds has decreased.

Limited age data suggest that the scallop stock historically exploited off west Kodiak Island experienced an age-structure shift from predominately age 7 and older scallops in the late 1960's to an age structure predominated by scallops less than age 6 during the early 1970's. This shift indicated that harvest amounts had exceeded sustainable levels. Changes in fleet distribution from historical fishing grounds primarily in State waters to previously unfished grounds in the EEZ compounded management concerns.

In response to these concerns, the ADF&G implemented a management plan for the scallop fishery in 1993-94 that established a total of nine fishery registration areas corresponding to the Southeastern, Yakutat, Prince William Sound, Cook Inlet, Kodiak, Alaska Peninsula, Dutch Harbor, Adak, and Bering Sea portions of the State. To prevent overfishing and maintain reproductive potential of scallop stocks, ADF&G established a guideline harvest range (GHR) for each of the traditional weathervane scallop fishing areas. In the absence of biomass estimates needed to implement an exploitation rate harvest strategy, the upper limit of the GHRs are specified as the long-term productivity (catch) from each of the traditional harvest areas. The ADF&G may adjust GHRs based on changes in stock status, such as shifts in population size/age structure coupled to changes in area-specific catch-per-unit-effort. If a GHR for a registration area is not specified, ADF&G may authorize fishing for weathervane or other scallop species under special use permits that generally include location and duration of harvests, gear limitations and other harvest procedures, periodic reporting or logbook requirements, requirements for onboard observers, and scallop catch or crab bycatch limits.

The ADF&G also has implemented king and Tanner crab bycatch limits to constrain the mortality of Tanner crab and king crab incidentally taken by scallop dredge gear. Generally, crab limits are set at 1 percent of total crab population for those management areas where crab stocks are healthy enough to support a commercial fishery. In areas closed to commercial fishing for crab, the crab bycatch limits for the scallop fishery are set at 0.5 percent of the total crab population.

Specified waters are closed to fishing for scallops to prevent scallop dredging in biologically critical habitat areas, such as locations of high bycatch of crab or nursery areas for young fish and shellfish. State regulations also require each vessel to carry an observer at all times to provide timely data for monitoring scallop catches relative to GHRs and for monitoring crab bycatch. Observers also collect scientific data on scallop catch rates, size distribution and age composition. This information is required by ADF&G for potential adjustment of GHRs based on changes in stock status and productivity.

Last, ADF&G regulations establish gear specifications to minimize the catch of undersized scallops and efficiency controls to reduce the economic feasibility of harvesting scallops much smaller than sizes associated with optimum yield. Current efficiency controls include a ban on automatic shucking machines and a crew limit of 12 persons.

The 1995 scallop guideline harvest levels and crab bycatch limits, as well as 1994 - 1995 scallop harvest and crab bycatch amounts in each State registration area opened for harvest in 1994-95 are listed in Table 2. In 1994, vessels fished for scallops in the Bering Sea and Alaska Peninsula registration areas under special-use permits. These areas were closed in late summer due to crab bycatch. The 1994 scallop fisheries in other registration areas generally were closed based on the attainment of the guideline harvest level (GHL) (Table 2).

1.4.2 Impact of Federal regulations on State management activities

Under the FMP, regulations that close Federal waters to fishing for scallops could displace fishing effort into State waters, which may remain open to fishing for scallops under State regulations. A closure of Federal waters will be implemented in consultation with the Commissioner of the ADF&G so that the State may implement any adjustments to its scallop management program that the State deems necessary to address anticipated changes in fishing effort in State waters. Adjustment of management measures could include reductions to State GHLs or closure of State waters. All vessels fishing for scallops under the jurisdiction of the State are required to carry an observer at all times. Effort and catch data will be collected by the State so that established guideline harvest amounts or crab bycatch limits are not exceeded. Given the State's management program currently in place for the scallop fishery and the State's ability to adequately monitor inseason catch amounts, closure of Federal waters to fishing for scallops should not pose a threat to the management of the scallop fishery in State waters.

Table 2. Alaska State scallop registration areas from where scallops were harvested in 1994-95[1], upper limit of GHRs (lbs shucked meat), 1995 Tanner (Tan) and king crab bycatch limits (number of crab), 1994 and 1995 scallop and crab catch amounts (in parenthesis) and season opening and closure dates (Ken Griffin, ADF&G, personal communication).

Area	GHR (catch)	Crab bycatch (catch)	1995 season open - closed dates
Yakutat	285,000	no crab limit	1/10/95 - 2/14/95
1995 catch	(245,000)[2]		
1994 catch	(259,206)		
Prince William Sound	50,000	Tan - 630	1/10/95 - 1/26/95
1995 catch	(48,000)[2]	(69)[2]	
No 1994 fishery			
Cook Inlet	20,000	King - 138	8/15/95 -
1994 catch	(20,431)	(42)	
		Tan - 18,070	
		(13,300)	
Kodiak	400,000	King - 283	7/1/95 -
1994 catch	(381,850)	(157)	
		Tan - 199,500	
		(69,274)	
Dutch Harbor	170,000	King - 45	7/1/95 -
1994 catch	(1,931)	(6)	
		Tan - 50,500	
		(792)	
Alaska Peninsula	Permit	King - 85	7/1/95 -
1994 catch	(66,412)	(0)	
		Tan - 52,530	
		(26,379)	
Bering Sea	Permit	King - 17,000	7/1/95 -
1994 catch	(505,439)	(55)	
		Tan - 260,000	
		(262,500)	

1/ The Southeastern registration area is closed to fishing and no harvests were reported from the Adak registration area.
2/ Scallop catch and crab bycatch amounts do not include unreported amounts taken by the catcher/processor vessel fishing in the management area outside of State jurisdiction.

2.0 MANAGEMENT PROGRAM FOR THE ALASKAN SCALLOP FISHERY

2.1 Management Objective

The objective of the FMP is to prevent localized overfishing of scallop stocks and protect the long term productivity of the resource to allow for the achievement of optimum yield on a continuing basis. This objective is based on the premise that uncontrolled fishing for scallops in Federal waters could result in irreversible damage to the resource's ability to recover in a reasonable period of time. Fishing on a stock at a level that severely compromises that stock's future productivity is counter to the goals of the Magnuson Act and seriously jeopardizes the opportunity to harvest optimum yield on a continuing basis under a future management regime that would authorize a regulated fishery for scallops in Federal waters. Conservative management of the scallop resource is warranted given (1) unprecedented activity of vessels fishing for scallops in Federal waters outside the jurisdiction of Alaska State regulations, (2) the harvesting and processing capacity of the scallop fleet, which, if allowed to fish unregulated in Federal waters, could exceed State harvest guidelines by several orders of magnitude, (3) inadequate data on stock status and biology, and (4) the vulnerability of the scallop resource to localized depletion.

The management program authorized under this FMP conforms to the Magnuson Act's national standards as listed in Appendix B. Under this FMP, the prevention of overfishing of the Alaska scallop stocks and the maintenance of adequate reproductive potential for the scallop resource takes precedence over other economic, social, management and research considerations.

2.2 Optimum Yield and Overfishing

A fishery management plan for scallops must specify an optimum yield (OY) for the scallop fishery. The OY for a fishery means the amount of fish which will provide the greatest overall benefit to the nation, with particular reference to food production and recreational activities. The OY is specified on the basis of the maximum sustainable yield from the fishery, as modified by any relevant economic, social, or ecological factors. The advisory guidelines established under 50 CFR part 602 for the national standards for fishery conservation and management state the most important limitation on the specification of OY is that the choice of OY, and the conservation and management measures proposed to achieve it, must prevent overfishing (§602.11(b)).

The determination of OY requires a specification of maximum sustainable yield (MSY). Biomass estimates for scallops are lacking, and the continuing exploratory nature of this fishery into new areas makes numerical estimation of MSY for weathervane and other scallop species not possible at this time. NOAA recognizes that there are cases where the specification of MSY may either be impossible or irrelevant. This may be due to lack of assessment data ... or because biological resiliency or high fecundity of some stocks or other fishery characteristic may allow OY to become a descriptive statement only, making a numerical calculation of MSY unnecessary. Nonetheless, the OY should still be based on the best scientific information available (§ 602.10(f)(4)(v)).

Overfishing is a level of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis. The definition of overfishing for a stock or stock complex may be expressed in terms of maximum level of fishing mortality or other measurable standard designed to ensure the maintenance of the stock's productive capacity. Overfishing must be defined in a way to enable the Council and the Secretary to monitor and evaluate the condition of the stock or stock complex relative to the definition. Overfishing definitions must be based on the best scientific information available and reflect appropriate consideration of risk. Risk assessments should take into account uncertainties in estimating harvest levels, stock conditions, or the effects of environmental factors.

2.2.1 Assessment of the available scientific data

The State of Alaska's draft fishery management plan for scallops (Kruse, 1994) presents a succinct summary of the best scientific data available on Alaska scallop life history traits and other biological parameters that should be considered in assessing an appropriate concept of MSY, OY, and overfishing for the scallop fishery. Pertinent portions of the State's management plan addressing current management concerns about recruitment overfishing and sustainable yield are incorporated in this FMP and are repeated below as follows:

> Recruitment Overfishing
>
> *Definition.* It is widely accepted that fishery harvest levels should be prescribed in ways to prevent "recruitment overfishing"--the condition that occurs when stocks are reduced to levels too low to produce adequate numbers of young scallops--the future recruits to the fishery (Gulland 1983). Recruitment is a prerequisite for maintenance of a viable population, and is needed for sustainable harvests that support long-term economic benefits from the fishery.
>
> *Worldwide History of Scallop Overfishing.* Although there are a number of cases of scallop fisheries that have been sustainable over long time periods....overfishing has occurred in many, if not most, scallop fisheries worldwide...Stock recovery has been either slow or non-existent. Attempts to develop aquaculture in many countries ... are largely attributable to the collapse of natural populations [Kruse (1994) provides examples of numerous cases of scallop overfishing that are not repeated here].....
>
> *Implications of Stock Structure.* Prevention of overfishing requires knowledge about a species stock structure and the biological productivity of each stock. For species with populations that are well-connected by extensive larval drift, risk of overfishing is relatively low at least on an area-specific level. In such cases, local depletions can be replenished by settlement of larvae carried by ocean currents from spawning stocks located elsewhere. However, as described in section [1.3.4], a growing body of evidence indicates that many benthic invertebrates, such as scallops, exist as a number of discrete, self-sustaining populations. To prevent overfishing for species with such a population structure, it is necessary to manage each stock separately (Caddy 1989; Fevolden 1989; Sinclair et al. 1985.)
>
> Unfortunately, the stock structure of weathervane scallops in Alaska is not well understood. Studies of genetic structure and comparative population characteristics (e.g., growth rate, gonadal somatic index) are needed to resolve uncertainties. In the absence of such information, a reasonable and conservative approach is to assume that each major fishing area compromises a separate stock (Caddy 1989; Sinclair et al. 1985). However, even with this approach, the possibility exists that multiple self-sustaining populations exist within a fishing area. For example, the apparent existence of separate self-sustaining populations of sea scallops on the Northern Edge and Northeast Peak of Georges Bank (Tremblay and Sinclair 1992; McGarvey et al. 1993) is somewhat unexpected given ocean currents and proximity of these areas to other scallop fishing grounds on Georges Bank.
>
> *Importance of Spawning Stock Biomass.* Even after scallop stocks have been defined, overfishing will occur unless fishing mortality is limited to a level commensurate with the productivity of each stock based on life history and other biological characteristics. Worldwide, scallop populations are characterized by recruitment variability....Often, scallop populations are dominated by a few strong year classes that are separated by long periods of poor recruitment... Potential stock-recruitment relationships have not been well studied for scallops. A recent study by McGarvey et al. (1993) provides a rare example with good evidence of a relationship between spawning stock (total egg production) and recruitment for sea scallops on Georges Bank. In that instance, higher egg production was directly related to higher recruitment.

[Conversely], it is commonly assumed that scallop recruitment is linked to environmental conditions (Hanock 1973)... However, even when recruitment of a marine species is primarily driven by environmental effects, it is commonly held that parental spawning biomass affects recruitment, at least at low population sizes...Recently, Peterson and Summerson (1992) showed that the bay scallop (Argopecten irradians concentricus) was recruitment limited due to reduced abundance of adults caused by a red tide (Ptychodiscus brevis) outbreak. In relating their findings to fishery management, the authors noted that a common assumption of shellfish fisheries management was that fishing pressure on adults will not adversely affect subsequent recruitment. Peterson and Summerson (1992) concluded that this assumption was unjustified.

Sustainable Yield

Ideally, an appropriate harvest rate is developed from yield models based on a species' life history traits and other biological parameters. Then, annual catches are specified by applying these harvest rates to annual biomass estimates derived from stock assessment surveys. Unfortunately, limited information on biological productivity is available for weathervane scallops to promote the conservation of stocks and sustained yields of the fishery. Biomass estimates are unavailable and yield models have not been developed.

In Alaska, most available information was collected during the early years of the fishery (Haynes and Powell 1968; Hennick 1970b, 1973), although it has been summarized more recently by Kaiser (1986). In the early 1950's the Bureau of Commercial Fisheries began systematic surveys to determine whether commercial quantities were available. The only assessment survey since 1972 was conducted in 1984 in lower Cook Inlet (Hammarstrom and Merritt 1985). Likewise, until the implementation of [the State's] onboard observer program in 1993, there have been no routine biological or fishery sampling programs conducted on weathervane scallops in Alaska.

Implications of Natural Mortality Rate. Natural mortality is one of the biological reference points commonly used in fisheries management to establish appropriate exploitation rates (Clark 1991). As discussed in section [1.3.3], the longevity (28 years) of weathervane scallops in Alaska implies that this species experiences a very low natural mortality rate (M approximates 0.16 or 15 percent annual mortality). The biological reference point, obtained by setting instantaneous fishing mortality (F) equal to M, implies that scallop harvest rates should not exceed 15 percent annually on any given stock. Unfortunately, other potentially useful benchmarks that would bear on the choice of appropriate exploitation rates for weathervane scallops are not presently available. A study of alternatives in is progress [by the ADF&G].

The biological reference point, F=M=0.16, implies that weathervane scallop stocks are at greater risk of overfishing than red king crab (Paralithodes camtschaticus) and Tanner crab (Chionoecetes bairdi) for which an M=0.3 has been estimated (NPFMC 1990). Also, unlike many crab stocks [off Alaska], there are not stock assessments of weathervane scallop biomass. Given these two observations, maintenance of healthy weathervane scallop stocks poses a serious challenge to fishery managers.

Implications of Recruitment Variability. Large annual fluctuations in recruitment, typical of scallop populations, have management implications. Weathervane scallops spawn annually after reaching maturity at age 3 or 4. This feature of multiple spawning (termed *iteroparity*) is likely to be an evolutionary response to environmentally-induced recruitment variations (Murphy 1968). Iteroparous species, with highly variable recruitment, are particularly vulnerable to overfishing when high levels of harvest create a recruit-only fishery.

Murphy (1967) simulated the effects of fishing on Pacific sardine (Sarinops sagax) age structure so that the population approached a single reproducing age class. Compared to an unfished populations with

a protracted age structure, abundance of the fished population was much lower and more variable. The fished population recovered slowly even when fishing was terminated and it had a higher probability of extinction than the unfished population.

These results led Murphy (1967) to assert the need to maintain age structure in populations with long life spans that experience environmentally-driven recruitment. This same advice was advanced by Leaman (1991) for the long-lived rockfishes (Sebastes). By comparison of longevity with other scallop species (Orensanz et al. 1991), weathervane scallops, with a maximum age of 28 (Hennick 1973), may be the longest-lived scallop species in the world. That is, the advice of Murphy (1967, 1968) and Leaman (1991) is apropos.

Sustainability of Weathervane Scallop Harvests. Changes in the Alaskan scallop fishery through 1992 raised concerns that recent (through 1992) harvests may not be sustainable on a local or regional level for several reasons. First, recent landings were 2-3 times higher than the long-term average harvest taken over a 20-year period during the 1970s and 1980s. In fact, these harvests are at levels comparable to those taken in the late 1960s and early 1970s which proved not to be sustainable by the fishery. Reduced scallop abundance was at least partly responsible for the fishery collapse in the 1970s. Second, high harvests since 1990 were at least partly attributable to shifts in fishing effort to new scallop beds. Third, during 1992 limited inseason catch reports from some areas indicated that small scallops were constituting an increased portion of landings as had occurred prior to the fishery decline in the mid-1970s. Last, misreporting was suspected. If misreporting was widespread, it would seriously compromise the data base of historical catches upon which assessments of sustainable harvests are based.

2.2.2 Specification of OY and overfishing

Instead of specifying OY as a fishing rate or constant catch level, the long-term OY specification for the scallop resource in Federal waters off Alaska (all species) is specified as a numerical range. In the absence of biomass estimates needed to implement an exploitation rate harvest strategy, the OY is specified as the long-term productivity. The OY range proposed is zero to 1,100,000 pounds of shucked scallop meats, and is derived from historical catches harvested from Federal waters. The low end of the range is the lowest catch on record (zero pounds in 1978). The high end of the OY approximates the highest catch taken from Federal waters since the 'fishing up' period (1,087,450 pounds in 1993). During the period of time Federal waters are closed to fishing for scallops under section 2.3.1 of this FMP, OY is equal to zero for the same reasons that support the closure.

As discussed above in section 2.2.1, the lack of biological information on Alaskan scallops inhibits the numerical specification of overfishing. Although it is difficult to define precisely the level at which overfishing jeopardizes recovery of a stock, there are indicators of existing or impending overfishing that should be heeded. For the reasons discussed above, recent harvest levels of scallops off Alaska may not be sustainable. This concern, as well as other uncertainties about the scallop biomass and stock dynamics must be taken into account in developing an overfishing definition. Although overfishing could be defined as a fishing mortality rate for weathervane scallops, based on existing life history data, the lack of stock assessment information (surveys, population age or size structure) limit the use of an overfishing rate at this time. As in the case for other stocks where very little biological information is available (Rosenberg et al. 1993), overfishing can be defined as landings that exceed optimum yield. As data collected from the fisheries and/or assessment surveys of the scallop resource are analyzed, overfishing for scallops may be defined on a fishing mortality rate basis. Until better information becomes available, overfishing is defined as landings that exceed optimum yield.

The scallop FMP must ensure that fishing effort on the scallop stocks will not cause OY (and the overfishing level) to be exceeded. An interim closure of Federal waters to fishing for scallops during the period of time management agencies examine existing or new fishery data is necessary to assess the merits of different conservation measures needed to control a fishery in Federal waters. The long-lived nature of scallops means that

most scallops not harvested in Federal waters during the closure would become available when either the FMP closure expires or the FMP is superseded by either an alternative management plan or FMP amendment that authorizes a fishery in Federal waters in a manner that does not jeopardize the long-term capacity of the stocks to produce MSY.

Because scallops have only been harvested by U.S. vessels in the past, and effort remains high, it is likely that the OY can be fully harvested by U.S. vessels, and fully processed by U.S. processors in future years. In fact, current capacity of the U.S. scallop fleet in Alaska exceeds current guideline harvest levels for scallops. Hence, no considerations have been made to allow a foreign fishery on Alaskan scallops.

2.3 Management Measures

2.3.1 Closure of Federal waters

The only management measure authorized under the proposed FMP to control fishing effort and avoid overfishing of scallop stocks is an interim closure of Federal waters off Alaska to fishing for scallops to protect the scallop resource from unregulated fishing and localized overfishing during the period of time a more long-term fishery management plan is prepared that would allow for controlled harvesting of scallops in Federal waters. Closure of Federal waters is necessary and appropriate for the protection and promotion of the long-term health of the scallop resource and stability of the scallop fishery under a future fishery management plan authorizing fishing for scallops in Federal waters. Closure of Federal waters to prevent an unregulated fishery also would mitigate any potentially adverse impact crab bycatch in the scallop fishery may have on either crab stocks or their habitat off Alaska. Given that the interim closure is intended to be superseded by a long-term FMP, the closure would be effective until either (1) a date 1 year from the date the regulations implementing the FMP become effective, or (2) the FMP is superseded by a future FMP or FMP amendment that implements management measures that would allow the controlled harvest of scallops in Federal waters without overfishing.

2.3.2 Data assessment and collection

NMFS, in coordination with other management agencies, should initiate efforts to identify and gather the data needed to improve management agency understanding of the dynamics of the scallop resource and the effect of exploitation on the stocks capacity to produce MSY on a continuing basis. The type of information that should be pursued Alaska include (1) stock abundance and size/age structure, (2) scallop biology, life history, and stock production parameters, (3) analyses of population thresholds and recruitment overfishing; (4) estimation of optimum dredge ring size or minimum shell height based on studies of rates of growth and mortality; (5) investigations of exploitation rates and alternative management strategies; (6) genetic stock structure; and (7) new gear designs to reduce bycatch and to minimize adverse effects on bottom habitat. This objective may be attained, in part, with data collected by the Alaska State observer program. However, assessments of the scallop resource off Alaska, as well as the conduct of other scallop research will be dependent on Federal funding, State of Alaska general fund appropriations, or future amendments to the FMP that would authorize experimental fishing under Federal permit conditions.

2.3.3 Administrative and enforcement costs

Administration and enforcement of the FMP would involve minimal costs given the limited nature of the management measure authorized under the FMP, i.e., closure of Federal waters to fishing for scallops. Administrative costs will increased as staff resources are required to develop future management measures. Significant costs would result from a meaningful data collection program that, ideally would include a resource assessment of the Alaska scallop stocks. A good comprehensive survey of the sea scallop grounds in the Gulf of Alaska and the Bering sea would require a 90-day cruise. Such a cruise probably cannot be part of ongoing groundfish research cruises because a different type of sampling gear, such as a specialized scallop dredge, likely would be required. The estimated cost of such a survey would be about $540,000 (assume a vessel charter with

scientific personnel cost at $6,000 per day for a 90-day cruise). There would also be a need for data entry, data workup, and general staffing functions to make the information useable, estimated to be one staff -year.

A desirable part of the data collection program would involve collection of fisheries statistics and biological specimens from the fisheries for status of stocks analyses. A closure of Federal waters to fishing for scallops would constrain this data to State waters until such time the FMP is amended or superseded to authorize a fishery in Federal waters.

2.3.4 Impact on the fishery

No foreign vessels have ever participated in the Alaska scallop fishery and no Indian treaty fishing right exist for scallops. Therefore, the impact of the interim closure of Federal waters to fishing for scallops authorized under this FMP would be incurred solely by the domestic commercial fishery.

Closure of the EEZ to fishing for scallops would cause substantial impact to participants in the Alaskan scallop fisheries. Of the 16 vessels making landings of scallops in 1994, 11 vessels landed no other catch, indicating their dependence on this resource. These vessels accounted for 88 percent of the scallops harvested in Federal and State waters during 1994, or approximately 1.1 million lbs of shucked scallop meats. Using the 1994 average exvessel price of $6.00/lb and assuming that 14 percent of the total annual scallop landings would continue to come from State waters, this would equate to an annual forgone revenue of about $ 5.7 million. During 1994, an additional 5 vessels landed 0.1 million lbs of shucked scallop meats, equating to the potential for another $0.52 million in foregone revenue under the proposed closure. The scallop catch by these 5 vessels ranged from less than 1 percent to 46 percent of these vessels' total 1994 landed catch of all species, including groundfish and crab. Taken together, a one year closure of Federal waters the EEZ could result in foregone revenue on the order of $6.12 million.

Options available to vessels which would not be able to fish for scallops in the EEZ are limited. Beyond existing fisheries under Council management, the opportunities and capabilities of this fleet to engage in other fisheries imply a shift to one of several alternatives: (1) State-managed fisheries within Alaska; (2) state or federally managed fisheries in the U.S. outside Alaska; or (3) high-seas or foreign fisheries elsewhere in the world. Some of the vessels previously harvested scallops in the Atlantic Ocean, and may still qualify to fish for scallops on the East Coast. Although many scallop vessels could be rigged to fish for groundfish, the opportunities for new vessels to participate in North Pacific fisheries are limited. The Council recently adopted a moratorium on new vessels entering the groundfish and crab fisheries in the North Pacific.

Opportunities for new entrants in Alaska state-managed fisheries are restricted by the state's limited entry program that covers most of the important commercial fisheries, including salmon, sablefish, herring, and crab. In order to access most of these fisheries, new entrants from EEZ fisheries would have to purchase a permit, as well as adopt necessary vessel and gear modifications. In the case of salmon, asking prices for permits vary from around $50,000 up to over $250,000 for the most desirable areas. Salmon vessels in some areas have been developed to operate in specific regulatory and oceanographic conditions, such that halibut or groundfish boats may prove inadequate without modifications. The Alaska state fisheries are managed under a limited entry permit system because of existing concerns over excess capacity, such that the entry of vessels from Council-managed fisheries would require the exit of an existing vessel. In general, there appear to be few, if any, unexploited opportunities in existing state-managed fisheries that are capable of absorbing an influx of new entrants from the EEZ fisheries.

Outside domestic waters, fishing opportunities are less certain, although it is recognized that excess harvesting capacity exists for many of the world's developed fisheries. Following the extension of fisheries jurisdiction in the mid-1970s, most coastal nations--led by the U.S.--endeavored to claim the economic benefits associated with the marine resources in their exclusive economic zones, greatly reducing the opportunities for distant water fleets of some countries. As a result, access to the coastal waters of foreign nations must be arranged through joint

venture arrangements, in competition with the distant water fleets of many other nations, such as Japan and Korea. However, the shift to foreign fisheries requires both logistical and diplomatic arrangements that may be beyond the scope of many small boat operators. Also, opportunities for the Alaska fleet in foreign fisheries likely favor technologically advanced, higher valued vessels not readily available in the host country.

In summary, the problems associated with excess capacity and overcapitalization cannot be easily overcome by shifting unneeded vessels to other fisheries. This is not so much because of an incompatibility of technology, as the dilemma of widespread overcapitalization. Efficient, adaptable vessels are capable of shifting to other fisheries, and may well enter different fisheries in response to economic efficiency criteria. Entrepreneurs may also be capable of finding and competing in a variety of world-wide fisheries. Overall, however, there is no simple means of shifting excess Alaska EEZ vessels into other fisheries in the current environment, primarily because already there appears to be more than adequate capacity throughout the Alaskan, U.S. and world fishing industry.

There continues to be the possibility of a fishery for scallops in State waters. However, only about 14 percent of the resource was taken in State waters in 1994. Any State fishery would likely have to be of very short duration to prevent that portion of the State GHL from being exceeded.

Because of the longevity and low natural mortality associated with weathervane scallops, the yield from this fishery would essentially be recouped when the fishery is reopened, either one year after the proposed FMP goes into effect, or before that time if the FMP is superseded by FMP amendment instituting a comprehensive management plan for scallops.

3.0 APPENDICES

Appendix A - Description of the Alaska Scallop Fishery and Management

Interest in an Alaskan scallop fishery has existed since the early 1950's when the Bureau of Commercial Fisheries began systematic surveys to determine if commercial quantities were available. The first commercial deliveries of weathervane scallops were made in 1967. Since then, the numbers of vessels, numbers of landings and harvest (weight of shucked meats) have varied annually (Table A.1.1). Total commercial harvest of scallops has fluctuated from a high of 157 landings totaling 1,850,187 pounds of shucked meats by 19 vessels in 1969 to no landings in 1978. Prices and demand for scallops have remained high since fishery inception. Harvests in 1990 and 1991 were the highest on record since the early 1970's. The 1992 harvest was even higher at 1,810,788 pounds. On average, about two-thirds of the scallop harvest has been taken off Kodiak Island and about one-third has come from the Yakutat area; other areas have made minor contributions to overall landings. Harvest peaks have occurred as new beds were discovered or old beds recovered and then became depleted (Table A.1.2). From 1969 through 1990, landings from State waters averaged about 39 percent of the total but more recent landings increasingly have been taken mostly from Federal waters (Table A.1.3). Changes in catch-per-unit-effort (CPUE) could not be monitored, as the unit measure of effort (number of days as measured by trips) has not been consistent through the time series. Many vessels switched from landing fresh to frozen product during the late 1980's, extending the average trip from about 10 days to perhaps 20 or more.

The size of the scallop fishing fleet off Alaska has fluctuated since the fishery began in 1967. Since then, up to 19 vessels per year have participated in the fishery. In 1992, only 7 vessels were actively fishing for scallops. Annual variability in the number of participants is due to both scallop abundance and the potential revenues generated by other fisheries (Kaiser 1986; Bourne 1991). Historically, many of the vessels participating in the fishery have dropped out after only one year (Table A.1.4). By 1992, only one vessel had participated for more than four consecutive years. Examination of the number of landings made by vessels in 1994 indicates that 11 out of 16 participants were "full time" scallopers, whereas vessels may have fished part time for scallops in previous years (Table A.1.5). Since the beginning of the fishery, scallops have been harvested by vessels and companies from the East Coast (Browning 1980). The same situation occurred through 1994; of the 16 vessels used to fish for scallops in 1994, 7 were registered to persons living in Alaska, and 9 outside the State, primarily from the mid-Atlantic area. No foreign vessels have ever participated in the scallop fishery in Alaska, and no Indian treaty fishing rights exist for this fishery.

Throughout the history of the Alaska scallop fishery, vessels fished nearly exclusively for weathervane scallops. Although scallop fisheries could potentially target species other than weathervanes, they have not done so. Landings of other scallop species were made by one vessel in 1991 and 1992, but due to confidentiality of the data, total landings of other species cannot be reported. Landings of other scallops may have been made in earlier years, but scallop species were not differentiated on fish tickets prior to 1991. Apparently, some amount of pink scallops were landed in 1979 (Kaiser 1986). Little information on the abundance and distribution of these other species is available. It is not known to what extent the scallop species are harvested by recreational or subsistence fisheries, however based on anecdotal information, some recreational diving for pink scallops occurs in Southeast Alaska.

Currently, the "average" scallop vessel is about 90-110 ft long and carries a crew of 12. In the 1980's, several small (< 50 ft) vessels participated in the fishery. The length distribution of vessels participating in the scallop fishery since 1980 is shown in Table A.1.6. The gear used to catch scallops commercially is the dredge of a standard design, with a regulated minimum ring size (Figure A.1). This type of fishing gear typically harvests only 5-35 percent of the scallops in their path, depending on dredge design, target species, bottom type, and other factors (McLoughlin et al. 1991). Although dredge width has varied in size through the history of the fishery, recent State regulations have limited dredges to a maximum width of 15 feet. Traditionally, scallops have been processed at sea by manual shucking, with only the meats (adductor muscles) landed. The technology for automated mechanical shucking exists, and apparently can process Alaskan scallops. However, this type of

shucking was recently prohibited by the State for weathervane scallops and in the East Coast sea scallop fishery to control effort.

Fishing operations at sea generally involve the following steps: 1) dredge setting, 2) towing for about one hour, 3) dredge retrieval, 4) dumping of the catch on deck, 5) sorting out scallops to be retained, and 6) discarding of debris, small scallops and bycatch of other species. Retained scallops are shucked by the crew, and usually washed, sorted, and frozen (or iced) at sea. DuPaul and Carnegie (1994) reported on scallop fishing procedures during the weathervane scallop fishery off Yakatat in July 1993. They reported that fishermen generally retained most large scallops (> 85 mm SH). Small scallops (< 85 mm SH) comprised a very small percentage (< 5 percent) of the catch, and were not retained. Scallops in the 100-130 mm SH range comprised the vast majority of the catch, corresponding to meat counts of 28 to 48 meats per pound of shucked adductor muscles. In the 1993 scallop fisheries statewide, the largest scallops were taken in the Kodiak Island and Bering Sea areas (Figures A.2 and A.3).

Economic trends of the fishery depend upon the performance measures considered. For example, vessels averaged 212,000 pounds each during the early "fishing-up period" (1970-1973) of the fishery. During 1974-1986, landings per vessel averaged only about one-third (66,000 pounds) of the 1970-1973 average as stocks recovered from high harvest levels, but increased to about one-half (114,000 pounds) of the original level during the 1987-1991 period. Note that the average landings per vessel in 1992 (258,684 pounds) was the highest in the history of the fishery (Table A.1.1). On the other hand, average gross receipts (exvessel value) per vessel reveal a different trend due to price effects during these same three time periods: $234,000, $178,000, and $400,000, respectively.

Average annual exvessel price has increased through the time series, with a distinct break occurring between 1975 and 1980 (Table A.1.1). In the early years of the fishery, 1968-1975, exvessel price per pound ranged from $0.85 to $1.40. Prices in the early 1980's were much higher, with exvessel prices ranging from $3.77 to $4.88. Prices decreased somewhat through the early 1990s, with a range of $3.12 to $3.88 observed from 1985 to 1992. Price increased in 1993 and 1994 to $5.00 and $6.00, respectively (Ken Griffin, ADF&G, personal communication).

Table A.1.1. Historic number of vessels, number of landings, landed weight of shucked meats, price per pound, exvessel value, landings per vessel, and exvessel value per vessel for the weathervane scallop fishery in Alaska during 1967-1994. All data for 1967-1968, and prices and exvessel values for 1967-1975 and 1979 were taken from Kaiser (1986); all other data were summarized from fish tickets (Kruse 1994). The 1994 data are preliminary. In years when only one or two vessels participated in a fishery, the harvest statistics are confidential.

Year	No. of Vessels	No. of Landings	Landings Wt. (lbs)	Price ($/lb)	Landings Exvessel Value ($)	(lbs) per Vessel	Value ($) per Vessel
1967	<----------Confidential---------->						
1968	19	125	1,677,268	0.85	1,425,678	88,277	75,036
1969	19	157	1,850,187	0.85	1,572,659	97,378	82,772
1970	7	137	1,440,338	1.00	1,440,338	205,763	205,763
1971	5	60	931,151	1.05	977,709	186,230	195,542
1972	5	65	1,167,034	1.15	1,342,089	233,407	268,418
1973	5	45	1,109,495	1.20	1,331,394	221,881	266,279
1974	<----------Confidential---------->						
1975	4	56	435,672	1.40	609,941	108,918	152,485
1976	<----------Confidential---------->						
1977	<----------Confidential---------->						
1978	0	0	0	-	0	0	0
1979	<----------Confidential---------->						
1980	8	56	632,535	4.32	2,732,551	79,067	341,569
1981	18	101	924,441	4.05	3,743,986	51,358	207,999
1982	13	120	913,996	3.77	3,445,765	70,307	265,059
1983	6	31	194,116	4.88	947,286	32,353	157,881
1984	10	61	389,817	4.47	1,742,482	38,982	174,248
1985	8	53	647,679	3.12	2,020,758	80,599	252,595
1986	9	86	682,622	3.66	2,498,397	75,847	277,600
1987	4	55	583,043	3.38	1,970,685	145,761	492,671
1988	4	47	341,070	3.49	1,190,334	85,268	297,584
1989	7	54	525,598	3.68	1,934,201	75,085	276,314
1990	9	144	1,488,64	3.37	5,016,724	165,405	557,414
1991	7	144	1,191,014	3.76	4,478,213	170,145	639,745
1992	7	137	1,810,788	3.88	7,028,702	258,684	1,004,100
1993	15	155	1,428,976	5.00	7,144,880	95,265	476,325
1994	16	118	1,235,267	6.00	7,411,614	77,204	463,226

Table A.1.2. Landings of scallops by year, registration area, and species, 1980-1994.

		Weathervane Scallops		Pink Scallops		Annual Totals	
		Pounds	Vessels	Pounds	Vessels	Pounds	Vessels
Year	Registration Area						
1980	(A) Southeastern Alaska	*	2	0	0	*	2
	(D) Yakutat	**	6	0	0	**	6
	(K) Kodiak	371,018	7	0	0	371,018	7
	All Areas	632,535	8	0	0	632,535	8
1981	(A) Southeastern Alaska	*	1	0	0	*	1
	(D) Yakutat	**	10	0	0	**	10
	(K) Kodiak	460,890	15	0	0	460,890	15
	All Areas	924,441	18	0	0	924,441	18
1982	(A) Southeastern Alaska	*	3	0	0	*	3
	(D) Yakutat	168,353	6	0	0	168,353	6
	(K) Kodiak	435,802	8	0	0	435,802	8
	(M) Alaska Peninsula	205,534	6	0	0	205,534	6
	(O) Dutch Harbor	**	5	0	0	**	5
	All Areas	913,996	13	0	0	913,996	13
1983	(A) Southeastern Alaska	*	1	0	0	*	1
	(K) Kodiak	**	4	0	0	**	4
	(M) Alaska Peninsula	*	1	0	0	*	1
	(H) Cook Inlet	*	1	0	0	*	1
	All Areas	194,116	6	0	0	194,116	6

Table A.1.2 (continued)

		Weathervane		Pink Scallops		Annual Totals	
		Pounds	Vessel	Pound	Vessels	Pounds	Vessels
Year	Registration Area						
1984	(D) Yakutat	*	2	0	0	*	2
	(K) Kodiak	309,502	6	0	0	309,502	6
	(H) Cook Inlet	*	3	0	0	*	3
	All Areas	389,817	9	0	0	389,817	9
1985	(D) Yakutat	14,221	4	0	0	14,221	4
	(K) Kodiak	*	3	0	0	*	3
	(M) Alaska	*	1	0	0	*	1
	(O) Dutch Harbor	*	3	0	0	*	3
	(H) Cook Inlet	*	1	0	0	*	1
	All Areas	647,679	8	0	0	647,679	8
1986	(D) Yakutat	*	2	0	0	*	2
	(K) Kodiak	180,600	5	0	0	387,209	5
	(O) Dutch Harbor	387,209	5	0	0	387,209	5
	(H) Cook Inlet	*	3	0	0	*	3
	(Q) Adak - Bristol	*	1	0	0	*	1
	All Areas	682,622	9	0	0	682,622	9

Table A.1.2 (continued)

		Weathervane		Pink Scallops		Annual Totals	
		Pounds	Vessel	Pound	Vessels	Pounds	Vessels
Year	Registration Area						
1987	(D) Yakutat	*	1	0	0	*	1
	(K) Kodiak	*	3	0	0	*	3
	(O) Dutch Harbor	*	2	0	0	*	2
	(H) Cook Inlet	*	1	0	0	*	1
	(Q) Adak - Bristol	*	2	0	0	*	2
	All Areas	583,043	4	0	0	583,043	4
1988	(D) Yakutat	*	1	0	0	*	1
	(K) Kodiak	*	3	0	0	*	3
	(M) Alaska	*	1	0	0	*	1
	(O) Dutch Harbor	*	1	0	0	*	1
	All Areas	341,070	4	0	0	341,070	4
1989	(D) Yakutat	*	1	0	0	*	1
	(K) Kodiak	**	5	0	0	**	5
	(O) Dutch Harbor	*	1	0	0	*	1
	All Areas	534,763	7	0	0	534,763	7

Table A.1.2 (continued)

		Weathervane		Pink Scallops		Annual Totals	
		Pounds	Vessel	Pounds	Vessels	Pounds	Vessels
Year	Registration Area						
1990	(A) Southeastern	**	4	0	0	**	4
	(D) Yakutat	442310	8	0	0	442310	8
	(K) Kodiak	697003	7	0	0	697003	7
	(M) Alaska	*	2	0	0	*	2
	(O) Dutch Harbor	*	1	0	0	*	1
	(Q) Adak - Bristol	*	1	0	0	*	1
	All Areas	148864	9	0	0	148864	9
1991	(A) Southeastern	*	3	0	0	*	3
	(D) Yakutat	402571	5	0	0	402571	5
	(K) Kodiak	514348	4	0	0	514348	4
	(M) Alaska	*	1	0	0	*	1
	(O) Dutch Harbor	*	1	*	1	*	2
	(Q) Adak - Bristol	*	3	*	1	125523	4
	All Areas	113671	7	*	1	119101	8

Table A.1.2 (continued)

		Weathervane Scallops		Pink Scallops		Annual Totals	
		Pounds	Vesse	Pounds	Vessels	Pounds	Vessels
Year	Registration Area						
1992	(A) Southeastern	*	1	0	0	*	1
	(D) Yakutat	1020968	7	0	0	102096	7
	(K) Kodiak	*	3	0	0	*	3
	(O) Dutch Harbor	*	1	*	1	*	1
	(E) Prince William	208836	4	0	0	208836	4
	All Areas	1741578	7	*	1	181078	7
1993	(Q) Bering Sea	531668	9	0	0	531668	9
	(D) Yakutat	256493	10	0	0	256493	10
	(K) Kodiak	374908	10	0	0	374908	10
	All Areas	1428976	15	0	0	142897	15
1994	(Q) Bering Sea	505439	9	0	0	505439	9
	(D) Yakutat	259206	12	0	0	259206	12
	(K) Kodiak	381850	10	0	0	381850	10
	All Areas	1235269	17	0	0	123526	17

* Confidential data

** Data masked to prevent extraction of confidential data

Table A.1.3. Percentage of Alaska scallop landings from State (within 3 miles) and Federal waters (3-200 miles), by year from 1990 through 1994.

Year	State Waters	Federal waters
1990	46.9%	53.1%
1991	37.9%	62.1%
1992	73.6%	26.4%
1993	23.9%	76.1%
1994	13.7%	86.3%

Table A.1.4. Number of vessels participating in the scallop fishery 1980-1992, the number of years participating.

Number of Years Participating

Year	1	2	3	4	5	6	7	8	9	10	11	12	13
1980	8	0	0	0	0	0	0	0	0	0	0	0	0
1981	13	5	0	0	0	0	0	0	0	0	0	0	0
1982	4	6	3	0	0	0	0	0	0	0	0	0	0
1983	4	0	1	1	0	0	0	0	0	0	0	0	0
1984	4	2	1	1	1	0	0	0	0	0	0	0	0
1985	6	0	1	0	1	1	0	0	0	0	0	0	0
1986	5	2	0	0	0	1	1	0	0	0	0	0	0
1987	0	2	0	1	0	0	0	1	0	0	0	0	0
1988	1	0	2	0	0	0	0	0	1	0	0	0	0
1989	3	2	0	1	0	0	0	0	0	1	0	0	0
1990	2	3	2	0	1	0	0	0	0	0	1	0	0
1991	3	0	2	1	0	1	0	0	0	0	0	1	0
1992	1	2	0	2	1	0	0	0	0	0	0	0	1

Note: No vessels fished in 1978, and only two fished in 1979; of these, one fished for only 1 year, and one fished through 1982.

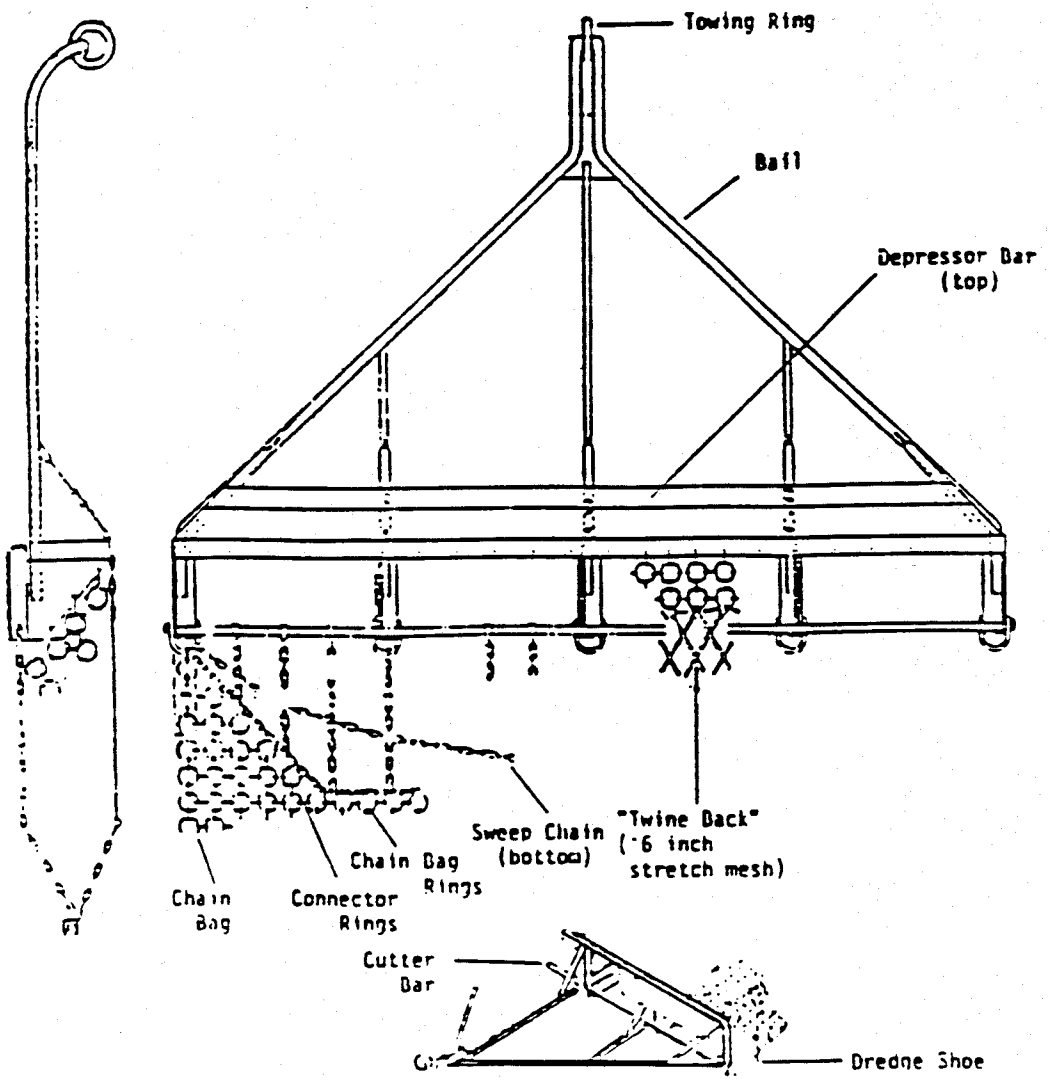
Table A.1.5 Number of vessels participating in the scallop fishery 1980-1992, by landing category.

	Number of Landings Per Vessel					
Year	1-5	6-10	11-15	16-20	21-25	26-30
1980	4	2	1	0	1	0
1981	12	3	2	1	0	0
1982	5	2	5	0	1	0
1983	5	0	0	0	1	0
1984	6	1	0	0	2	0
1985	7	0	0	2	0	0
1986	3	3	1	2	0	0
1987	1	2	0	0	0	1
1988	2	0	1	0	1	0
1989	3	3	0	1	0	0
1990	1	3	2	1	1	1
1991	1	1	3	1	2	0
1992		1	2	3	1	0

Table A.1.6 Number of vessels participating in the scallop fishery 1980-1992, by vessel length category.

	Length Category (ft)						
Year	<50	50-70	71-90	91-110	111-130	131-150	>150
1980	0	1	5	2	0	0	0
1981	0	2	11	4	0	1	0
1982	2	0	8	3	0	0	0
1983	4	0	1	1	0	0	0
1984	4	2	1	2	0	0	0
1985	3	1	1	3	0	0	0
1986	3	0	1	3	1	1	0
1987	1	0	0	2	0	1	0
1988	0	0	1	2	0	1	0
1989	0	1	2	3	1	0	0
1990	0	1	2	5	1	0	0
1991	0	1	1	1	2	1	1
1992	0	1	2	1	1	1	1
1993	0	3	8	2	1	1	0
1994	0	4	8	2	1	1	0

Note:Prior to 1980, nearly all vessels were 70-90 ft. One missing vessel in 1987.



Source: Food and Agriculture Organization (UN), 1972

Figure A.1 Scallop dredge design used in the U.S. east coast and Alaska sea scallop fisheries.

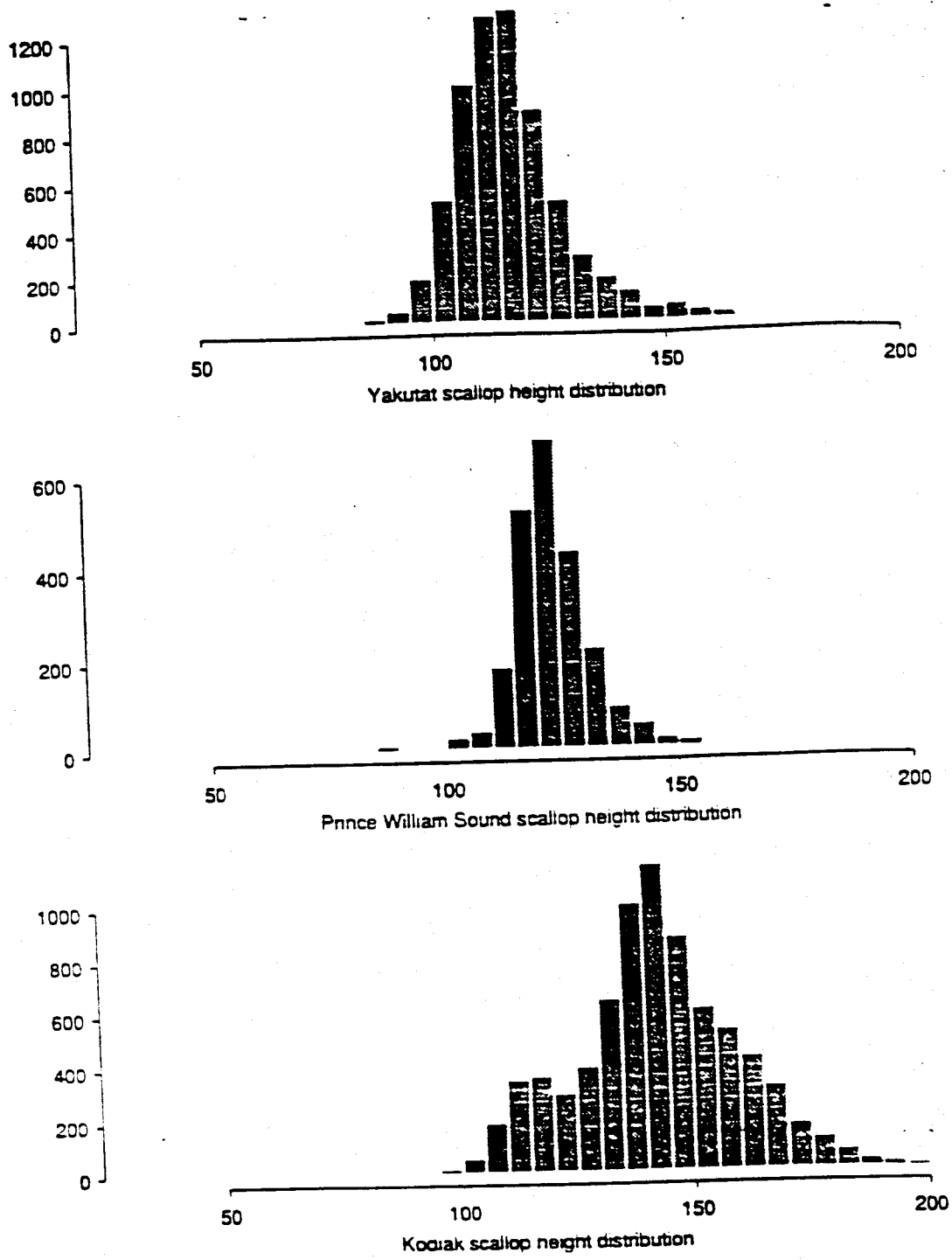


Figure A.2 Size frequency of scallops caught in the Yakutat, Prince William Sound, and Kodiak Management Areas during the 1993 scallop fishery. From Urban et al. (1994).

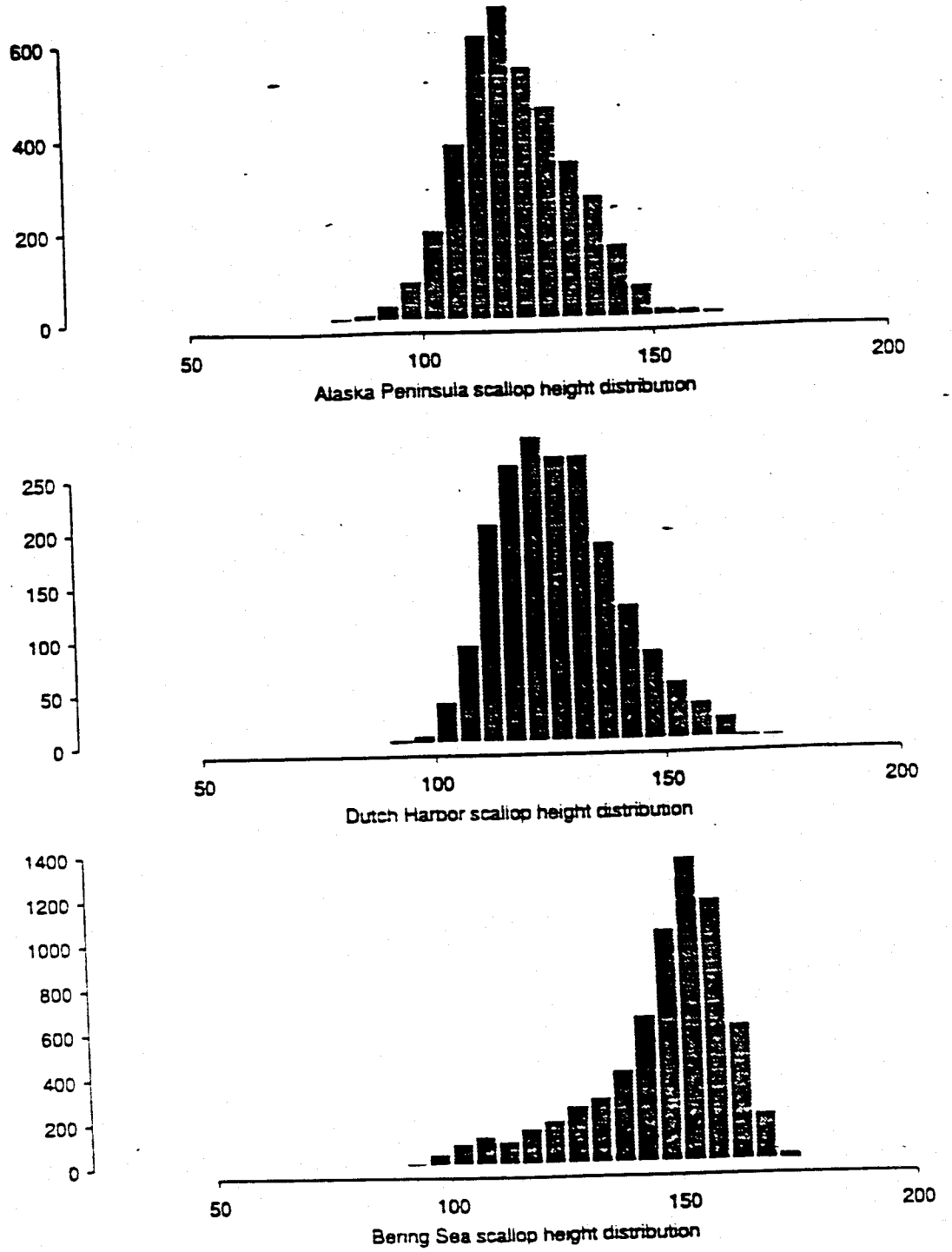


Figure A.3 Size frequency of scallops caught in the Alaska Peninsula, Dutch Harbor, and Bering Sea Management Areas during the 1993 scallop fishery. From Urban et al. (1994).

Appendix B - National Standards of the Magnuson Fishery Conservation and Management Act

The Magnuson Act (Section 301) sets the national standards for fishery conservation and management. Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the following national standards for fishery conservation and management:

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

(2) Conservation and management measures shall be based upon the best scientific information available.

(3) To extend the practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

(5) Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

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ENVIRONMENTAL ASSESSMENT/ REGULATORY IMPACT REVIEW/ INITIAL REGULATORY FLEXIBILITY ANALYSIS of the FISHERY MANAGEMENT PLAN for the SCALLOP FISHERY OFF ALASKA

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EXECUTIVE SUMMARY

Background. The scallop fishery in the Exclusive Economic Zone (EEZ) (3 to 200 nautical miles offshore) and in Alaskan state waters has been managed by the State of Alaska (State) since a fishery began in 1968. These regulations establish guideline harvest levels (GHLs) for different scallop registration areas, fishing seasons, open and closed fishing areas, observer coverage requirements, gear restrictions, and measures to limit the processing efficiency of undersized scallops that include a ban on the use of mechanical shucking machines and a limitation on crew size. No federal Fishery Management Plan (FMP) has been implemented in the fishery.

Purpose and Need for the Action. Federal management of Alaskan scallops may be necessary to prevent further over exploitation of the fishery. Under the current statutes, the State cannot limit effort of vessels fishing in the scallop fishery that are not registered with the State. At least one non-Alaska registered vessel has fished for scallops exclusively in the EEZ, with indications others may follow. The longevity of the species, its low mortality rate, and the generally unknown status of these stocks indicate they are susceptible to local and general overfishing. Along with unregulated fishing, the over capitalization of the fishery has highlighted the potential for quickly overfishing this resource and demonstrated the need for controlling the effort of all vessels fishing in the EEZ. It is incumbent on the Secretary of Commerce (Secretary) to provide a conservative, risk averse strategy to manage these stocks.

Alternatives Considered. There were three basic alternatives considered. The preferred alternative would close the EEZ off Alaska to fishing for scallops.

> Alternative 1: Status Quo -- Continue to defer all management of scallops to the State of Alaska. Under the status quo, the State would continue to manage the scallop fishery in State waters and the EEZ without Council oversight. This alternative would provide no specific federal management measure to control fishing in the EEZ. Vessels not registered in the State could continue to enter the fishery and fish in the EEZ without observers or restriction as to amount or size of scallops taken. Yearly catches could exceed the recent record harvest of 1.8 million lb in 1992, overfishing the resource.
>
> Alternative 2 (*preferred*): Develop a new FMP which would authorize closure of the EEZ for up to a 1 year period to all scallop fishing. This alternative would require a new, separate FMP for Alaskan scallops. Under this alternative, scallops would be under full federal management. It would preserve the scallop stocks by creating an interim closure of the EEZ to allow NMFS or the Council time to develop a comprehensive FMP without a regulatory hiatus in the fishery which would allow local overfishing. Scallops would be considered a prohibited species and retention would not be allowed in the EEZ. Because there would be no fishing allowed for scallops, no in-season management and monitoring of the fishery would be necessary.
>
> Alternative 3: Develop a new FMP for Alaskan scallops federalizing management of scallops in coordination with State regulations. This alternative would require a new, separate FMP for Alaskan scallops. It would require Federal regulations to complement management of the State. In-season management and monitoring of the fishery would be similar to the way groundfish are managed. A regulatory hiatus would occur before the steps necessary to complete a comprehensive management plan for this resource could be completed. Therefore, this alternative is not considered the preferred alternative for this action, although it may be considered for a future action.

Impacts on Scallops. The biological and environmental impacts on the scallop resource will depend on the alternative chosen. Under Alternative 1, the status quo, there would be no regulation that prevents vessels and fishermen not licensed by the State, to fish for scallops in the EEZ after the February 23, 1995 emergency rule expires. State authority and jurisdiction for fisheries in the EEZ depends on vessels being registered with the

State. Since the State cannot extend its jurisdiction to non-State registered vessels in the EEZ, scallop stocks can be potentially over harvested by non-licensed crew and vessels, which could make landings in states other than Alaska. Under Alternative 2, the preferred alternative, the fishery will be closed in the EEZ for up to 1 year, effectively eliminating any impact of the fishery on the environment in the EEZ. Alternative 3 includes issuance of federal fishing permits, and would incorporate all or most of the State's management measures, including GHLs. With GHL's, a more orderly fishery would be conducted. Because harvest would be limited by GHLs, there is a potential for a derby-style fishery, in which each vessel harvests as quickly as possible. Nevertheless, overall harvest levels would be maintained and the potential for overfishing would be reduced.

Impacts on Benthic Communities, the Physical Environment, Bycatch of Non-target Species and Catch of Allocated Groundfish. Given the best available information, the alternatives to the status quo are not reasonably expected to allow substantial damage to the ocean and coastal habitats, or to jeopardize the long-term productive capability of crab, herring, or groundfish stocks. Scallop dredges may have some potential, in some situations, to affect other organisms comprising benthic communities; however, these effects are not likely to be substantial for the relatively small scale scallop fisheries in Alaska. The preferred alternative would effectively preclude any impact on the environment or the stocks in the EEZ for the duration of the closure.

Impacts on Endangered Species and Marine Mammals. Species that are listed, or proposed to be listed, under the Endangered Species Act (ESA) that may occur in the Bering Sea and Aleutian Islands area (BSAI) or Gulf of Alaska (GOA) include the endangered fin whale (Balaenoptera physalus); sei whale (Balaenoptera borealis); humpback whale (Megaptera noveangliae); sperm whale (Physeter catodon); Snake River sockeye salmon (Oncorhynchus nerka) and short-tailed albatross (Diomedea albatrus); the threatened Steller sea lion (Eumetopias jubatus); Snake River fall and spring-summer chinook salmon (O. tshawytscha); and spectacled eider (Somateria fischeri). In summary, listed species of salmon, seabirds, and whales under the ESA will not be affected by the proposed alternative.

Fishery Status. Traditionally, the scallop fishery had been prosecuted by a small number of vessels, targeting exclusively on weathervane scallops. However, information indicated that stocks of weathervane scallops were fully exploited in 1992 and that an increase in effort was likely. Because scallops are highly susceptible to overfishing and boom/bust cycles world-wide, concern was raised over projected increases in effort. The North Pacific Fishery Management Council (Council) established a control date of January 20, 1993 in the event of a moratorium. The State established GHLs for 1993 and beyond. In 1993, 15 vessels landed scallops in the State and in 1994, 16 vessels landed scallops. Catches were reduced under State management. In February, 1995 a non-Alaska registered vessel was discovered fishing in the EEZ. Because it was not registered in the State, it was subject to neither State nor federal regulations. The fishery was closed by emergency regulation February 23, 1995, but not before the vessel individually took the equivalent of the entire GHL for the registration area in which it was located.

Impacts of the Status Quo. Retaining the status quo in the scallop fishery to allow an unrestricted fishery in the EEZ, would encourage overcapitalization, and, with it, overfishing. Vessels not already in the fishery would be encouraged to enter. Initial catches could exceed the 1992 catch of 1.8 million pounds (lb) (816 metric tons (mt)) for several years, but would soon fall off in the historical boom/bust cycle as the resource was overfished.

Impacts of Closing the EEZ. Closure of the EEZ to fishing for scallops would cause substantial impact to participants in the Alaskan scallop fisheries. A one year closure of the EEZ along with a concurrent closure of Alaskan State waters would result in those vessels forgoing revenue on the order of $6.2 million. Opportunities for the majority of these vessels to enter other fisheries are extremely limited. However, because of the longevity and low natural mortality associated with weathervane scallops, the yield from this

fishery would essentially be recouped when the fishery is reopened, either 1 year after the proposed FMP goes into effect, or whenever the FMP is superseded or amended.

Impacts of Federalizing State Management. The effects of federal fishery management of Alaskan scallops on existing users also depends upon the particular suite of management measures and regulations adopted. The exact set of regulations to be adopted cannot be specified at this time. For these reasons, it is not possible to estimate precise impacts of the management plan and regulations on existing users.

Costs and Benefits. Administrative, enforcement, and information costs for the preferred alternative are relatively small and would be assimulated within exisitng staff resources and budget. However, costs of staff resources necessary to prepare a comprehensive Federal FMP would be approximately $14,000, with an additional $540,000 needed for an initial scientific survey of scallops. Recurring funding on the order of $60,000 for data analysis has also been estimated. Enforcement costs could be $100,000/year for such an FMP.

Benefits of this action will be the preservation and maintenance of a viable scallop fishery under any of the alternatives.

1.0 INTRODUCTION

The scallop fishery in the EEZ and in Alaskan state waters has been managed by the State since a fishery began in 1968. Regulations are implemented by the Alaska Department of Fish and Game (ADF&G) at 5 ACC 38.076. These regulations establish GHLs for different scallop registration areas, fishing seasons, open and closed fishing areas, observer coverage requirements, gear restrictions, and measures to limit the processing efficiency of undersized scallops that include a ban on the use of mechanical shucking machines and a limitation on crew size. No federal FMP has been implemented in the fishery.

Actions taken to implement a FMP for the scallop fisheries must meet the requirements of Federal laws and regulations. Among the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA).

NEPA, E.O. 12866, and the RFA require a description of the purpose of and need for the proposed action, as well as a description of alternative actions which may address the problem. This information is included in Section 1 of this document. Section 2 contains information on the biological and environmental impacts of the alternatives as required by NEPA. Impacts on endangered species and marine mammals are also addressed in this section. Section 3 contains a Regulatory Impact Review (RIR) which addresses the requirements of both E.O. 12866 and the RFA that economic impacts of the alternatives be considered.

This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) addresses concerns that current management of the scallop fisheries in Alaska may fail to protect against over exploitation of the stocks. Specifically, this document provides background information and assessments necessary for the Secretary to determine if this FMP is consistent with the Magnuson Act and other applicable laws. It also provides the public with information to assess the alternatives that are being considered and to comment on the alternatives. These comments will enable the Council and Secretary to make more informed decisions concerning the resolution of the management problems being addressed.

1.1 Purpose of and Need for the Action

Federal management of Alaskan scallops may be necessary to prevent further over exploitation of the fishery. Under the current statutes, the State cannot limit effort of vessels fishing in the scallop fishery that are not registered with the State. At least one non-Alaska registered vessel has fished for scallops exclusively in the EEZ, with indications others may follow. The longevity of the species, its low mortality rate, and the generally unknown status of these stocks indicate they are susceptible to local and general overfishing. Along with unregulated fishing, the overcapitalization of the fishery has highlighted the potential for quickly overfishing this resource and demonstrated the need for controlling the effort of all vessels fishing in the EEZ. It is incumbent on the Secretary to provide a conservative, risk averse strategy to manage these stocks.

Problems with State Management

Until this year, all vessels participating in the Alaska scallop fishery have been registered under the laws of the State of Alaska and the fishery was monitored and controlled under State jurisdiction. Weathervane scallop resources off Alaska were first explored by a few vessels in 1967. The fishery grew rapidly over the next 2 years with about 19 vessels harvesting almost 2 million lb (907 mt) of shucked meat. Since then vessel participation and harvests have fluctuated greatly, but have remained below the peak participation and harvests experienced in the late 1960's. The State of Alaska has managed the scallop fishery in State and Federal waters, consistent with section 306(a)(3) of the Magnuson Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) (Magnuson Act), which allows a state to directly regulate any fishing vessel outside state waters if the vessel is registered under the law of that state.

The 1995 scallop season opened January 10 in the Yakutat and Prince William Sound State registration areas. The scallop quota for these areas was 250,000 lbs (11.3 mt) and 50,000 lbs (22.7 mt), respectively. The State closed the Prince William Sound area January 26 and the Yakutat area on February 14, when the respective quota for each area was reached. On February 10, the State of Alaska informed NMFS that a fishing vessel was dredging for scallops in Federal waters closed by the State and that the vessel was not registered under the laws of the State. As a result, the vessel operator allegedly was nopt subject to State regulations governing the scallop fishery, including requirements to carry an observer at all times to monitor scallop catch and crab bycatch. The State could not stop this uncontrolled fishing activity because the vessel was not registered and was, therefore, operating outside the State's jurisdiction.

NMFS received numerous phone calls from Alaska State registered scallop fishermen who expressed strong concern about continued uncontrolled fishing for scallops. Inquiries also were made about the possibility of other fishermen turning in their State licenses to receive an "unregistered status" so they also could fish in Federal waters outside the jurisdiction of State regulations.

On February 17, 1995, the Council held an emergency teleconference to address conservation concerns about uncontrolled fishing for scallops in Federal waters. During the teleconference, the Council requested NMFS to implement an emergency rule to close Federal waters to fishing for scallops to avoid the potential of localized overfishing of the scallop resource. On February 23, 1995, NMFS implemented the emergency rule to close Federal waters to fishing for scallops in response to conservation concerns that continued uncontrolled fishing for scallops in the Federal waters could result in localized overfishing of scallop stocks. This emergency rule is effective through May 30, 1995. A subsequent extension, as recommended by the Council at its February 17 teleconference, would make the emergency effective through August 28, 1995, at which time it would have to expire according to law.

Susceptibility to Overfishing

Although no comprehensive surveys or stock assessments for scallop stocks exist, recent large variations in harvest and shifts in effort to new fishing areas may indicate that the maximum sustainable yield of various beds were being exceeded prior to implementation of quotas in 1993. Additionally, some fishermen have testified that the average scallop "meat counts" have increased in recent years, meaning that the average size of scallops harvested were smaller than in previous years. A reduction in the average size (age) of animals harvested may indicate an increase in fishing mortality of larger individuals, or high recruitment (Ricker 1975). It has been well-established that scallop populations worldwide are vulnerable to overharvest, and stock recovery may be slow (Aschan 1991; Bannister 1986; Bourne 1986; McLoughlin et al. 1991; Orensanz 1986). For these reasons, significant increases in scallop harvests in Alaska beyond historic levels should be avoided, as they may jeopardize stock health and sustained yield.

The longevity of weathervane scallops in Alaska implies that they experience low natural mortality rates (Hoenig 1983), and this requires that conservative commercial harvests of weathervane scallops may be necessary to maintain healthy stocks and sustainable fisheries. The rate of natural mortality is one of the biological reference points commonly used in management of other fisheries to establish appropriate exploitation rates (Clark 1991). Unfortunately, other benchmarks that would bear on the choice of appropriate exploitation rates for weathervane scallops are not presently available; there is inadequate information on other biological production parameters, and uncertainty in scallop population dynamics for Alaskan scallop fisheries.

An unrestricted harvest in the EEZ would allow recruitment overfishing. It is widely accepted that fishery harvest levels should be prescribed in ways to prevent "recruitment overfishing", which is the condition that occurs when stocks are reduced to levels too low to produce adequate numbers of young scallops -- the future recruits to the fishery (Gulland 1983). Recruitment is a prerequisite for maintenance of viable populations, and is needed for sustainable harvests that support long-term economic benefits from the fishery. By closing

the EEZ to harvest, recruitment overfishing of scallops would be prevented, and a future fishery would be assured.

Overcapitalized Fleet

The existence of an overcapitalized fleet increases the potential of overfishing the resource in an unrestricted fishery. At its January 1993 meeting, the Council determined that unrestricted access to this fishery may be harmful to the resource and result in a net loss to the Nation. A control date of January 20, 1993 was set to place the industry on notice that a moratorium for this fishery may be implemented. This control date was again reaffirmed at the Council's June 1993 meeting. As anticipated, effort in this fishery apparently increased in 1993; 32 permits, representing 21 vessels were issued to fish scallops in 1993. Eleven of these vessels had made landings as of July 31, 1993, and a total of 15 vessels had made landings by the end of the year.

Even without additional vessels entering the fishery, the 1993 fishery was overcapitalized. In 1992, seven vessels harvested 1.8 million lb (816 mt), for an average of 257,143 lb (116.6 mt) harvested per vessel. The 1993 quota was set at 890,000 lb (403.7 mt) for areas with specified guideline harvest levels, or about one-half of the 1992 landings. Efficient harvesting of this quota could be done by only three to four vessels. Preliminary estimates of 1993 landings from areas without guideline harvest levels total 524,000 lb (237.7 mt), that potentially could have been taken by an additional two vessels. Yet, 11 vessels participated in the 1993 fishery by July 31. Hence, the 1993 fishery was overcapitalized, meaning that too much capital was invested relative to the fleet size necessary to efficiently conduct the fishery. In 1994 the fishery continued the trend; 16 vessels harvested 1,235,269 lb (560.3 mt) of scallops.

Conservation impacts of the scallop fishery in Alaska depend upon the particular suite of management measures adopted. Where no management exists there is every indication that the fishery would be subject to local and eventual general overfishing were the condition to persist. One vessel fishing in the EEZ without the effort restrictions on gear, and crew required by State law was able to take over 100 percent of the State's GHL (54,000 lb) (24.5 mt) in a week. When the overcapitalization of the fishery is considered, it is clear the current scallop fleet could take several years' worth of the State's GHL in many areas in several months.

Because of the serious effects unrestricted fishing in this overcapitalized fishery would have on this resource, this proposed action concentrates on strict conservation in the fishery. Ideally, management strives to achieve a balance of factors, such as cost-effectiveness, enforceability, resource conservation, and positive economic benefits that accrue from commercial harvests. Further, a management plan would provide mechanisms to gain information that can be used to improve the management without being too costly, and would provide for resource conservation without being overly restrictive to the fishery. However, there is insufficient time to adequately evaluate State management measures for consistency with the Magnuson Act, develop alternative federal management measures, and evaluate and establish a detailed optimum yield (OY) and associated acceptable biological catches (ABCs) for this fishery. In addition, legal and review constraints require a processing time for a FMP of up to 170 days from the time the FMP is first submitted until it is implemented. Management measures and authorities which would attain these other measures are expected to be contained in subsequent amendments to the proposed Secretarial FMP or a Council FMP.

Access to scallop fisheries within the management unit will be closed by the Secretary if the proposed FMP is adopted and approved. The State can also close State waters or limit access to a minimal extent by limiting the number of individual permits issued annually.

1.2 Alternatives Considered

1.2.1 Alternative 1: Status Quo -- Continue to defer all management of scallops to the State of Alaska.

Under the status quo, the State would continue to manage the scallop fishery in State waters and the EEZ without Council oversight. This alternative would provide no specific federal management measure to control fishing in the EEZ. Vessels not registered in the State could continue to enter the fishery and fish in the EEZ without observers or restriction as to amount or size of scallops taken. Yearly catches could exceed the recent record harvest of 1.8 million lb (816 mt) in 1992, overfishing the resource.

The commercial scallop fishery is currently being managed by the State under miscellaneous shellfish regulations, contained in Chapter 38 of the Alaska Administrative Code; these regulations authorize management in Alaskan State waters and extends management authority beyond Alaska's territorial sea to include the adjoining waters of the EEZ, (5 AAC 38.005 and 38.010). Because there is no federal fishery management plan, the state has authority to regulate scallop vessels, registered with the State, that fish outside of State waters in the EEZ. However, these regulations do not apply to vessels not registered in the State and fishing outside of State waters.

The Commissioner of ADF&G has promulgated regulations to manage scallops which went into effect June 27, 1993, (5 ACC 38.076). The Alaska Board of Fisheries (BOF) is developing a full scallop management plan for these regulations. The regulations:

1. Establish scallop registration areas;
2. Require vessel registration for each scallop registration area;
3. Allow a scallop vessel to be registered for only one scallop registration area at a time;
4. Require a scallop vessels fishing in non-traditional areas for species other than weathervane scallops, to obtain a permit issued by the department which may include:

    a. location and duration of harvests;
    b. gear limitations and other harvest procedures;
    c. periodic reporting, including logbook requirements;
    d. requirements for onboard observers; and
    e. catch or bycatch limits.

5. Define gear limitations, to include the ring size, prohibition of chaffing gear, limits the number of scallop dredges that may be used to two, and the width of the dredges to no more than 15 feet.
6. Define four types of scallop fishing areas within the state:

    a. Weathervane scallop quota areas: Have pre-determined harvest guidelines, which are seasonally apportioned, and will be closed to fishing once the GHL is achieved.
    b. Weathervane non-quota areas: These are either areas for which the department has not developed quotas, or areas that have not traditionally been fished by the scallop fleet. These areas may be opened under the conditions of a permit, at the discretion of the department,
    c. Non-weathervane scallop areas: These are areas that allow fishing for species other than weathervane scallops.
    d. Closed areas: These areas have been closed by the BOF to protect the king and Tanner crab stocks and would not be opened to commercial fishing until reviewed by the BOF at the 1994 spring meeting.

7. Establish fishing seasons for weathervane scallops in each of the registration areas.

Additional regulations are limiting the crew size on vessels to 12 members, including the captain, but not including ADF&G required observers, and prohibiting automatic shucking machines, effective July 1993. Other area specific regulations, which were in place prior to the development of the State's new plan, will remain in effect. These regulations include areas closed by the BOF for the conservation of king and Tanner crab resources as well as minor gear and harvest limitations.

1.2.2 Alternative 2 (*preferred*): Prepare a new FMP which would authorize closure of the EEZ for up to a 1-year period to all scallop fishing.

This alternative would require a new, separate FMP for Alaskan scallops. Under this alternative, scallops would be under full federal management. It would preserve the scallop stocks by creating an interim closure of the EEZ to allow the Secretary or the Council time to develop a comprehensive FMP without a regulatory hiatus in the fishery which would allow local overfishing. Scallops would be considered a prohibited species and retention would not be allowed in the EEZ. Because there would be no fishing allowed for scallops, no in-season management and monitoring of the fishery would be necessary.

Stock assessments of scallop species may be required. This Alternative, would require a specification of overfishing and ABC, and Total Allowable Catch (TAC). Annual stock assessments would be required.

1.2.3 Alternative 3: Prepare a new FMP for Alaskan scallops federalizing management of scallops based on State regulations

This alternative would require a new, separate FMP for Alaskan scallops. It would require Federal regulations to complement management of the State. In-season management and monitoring of the fishery would be similar to the way groundfish are managed. This approach would require that a suite of management measures be developed and assessed to support a controlled fishery for scallops in Federal waters. These measures could include, scallop quotas, fishing seasons, crab bycatch limits, closed waters, gear restrictions, limits on harvesting efficiency, observer requirements, and reporting requirements and possibly limited access. These measures would need to be implemented by August 28, 1995, when the anticipated extension of the emergency rule closing federal waters to fishing for scallops (60 FR 11054, March 1, 1995) expires. NMFS has determined that the period of time necessary to assess, develop, review and implement these measures would prevent them from being effective before the emergency rule expires. Under this alternative, therefore, a regulatory hiatus would occur before the steps necessary to complete a comprehensive management plan for this resource could be completed. Therefore, this alternative is not considered the preferred alternative for this action, although it may be considered for a future action.

A Fishery Management Plan for scallops allowing a fishery will require an assessment and specification of overfishing, and OY. A scallop "Stock Assessment and Fishery Evaluation" (SAFE) document would need to be prepared on a periodic basis.

2.0 NEPA REQUIREMENTS: ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

An environmental assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether the action considered will result in a significant impact on the human environment. The environmental analysis in the EA provides the basis for this determination and must analyze the intensity or severity of the impact of an action and the significance of an action with respect to society as a whole, the affected region and interests, and the locality. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact study (EIS) must be prepared if the proposed action may cause a significant impact on the quality of the human environment.

An EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers. The purpose and alternatives were discussed in previous Sections, and the list of preparers is in Section 9. This section contains the discussion of the environmental impacts of the alternatives including impacts on species listed as threatened and endangered under the Endangered Species Act (ESA).

The environmental impacts generally associated with fishery management actions are effects resulting from 1) overharvest of fish stocks which might involve changes in predator-prey relationships among invertebrates and vertebrates, including marine mammals and birds, 2) physical changes as a direct result of fishing practices affecting the sea bed, and 3) nutrient changes due to fish processing and discarding fish wastes into the sea. The proposed regulatory amendment is intended to result in improved conservation and management of scallop stocks in the EEZ off Alaska.

2.1 Potential Impacts on the Scallop Resource

The biological and environmental impacts on the scallop resource will depend on the alternative chosen. Under Alternative 2, the preferred alternative, the fishery will be closed in the EEZ, effectively eliminating any impact of the fishery on the environment in the EEZ. Alternative 3 includes issuance of federal fishing permits, and would incorporate all or most of the State's management measures, including GHLs. With GHL's, a more orderly fishery would be conducted. Because harvest would be limited by GHLs, there is a potential for a derby-style fishery, in which each vessel harvests as quickly as possible. Nevertheless, overall harvest levels would be maintained and the potential for overfishing would be reduced.

Under Alternative 1, the status quo, there would be no regulation that prevents vessels and fishermen not licensed by the State, to fish for scallops in the EEZ after the February 23, 1995 emergency rule expires. State authority and jurisdiction for fisheries in the EEZ depends on vessels being registered with the State. Since the State cannot extend its jurisdiction to non-State registered vessels in the EEZ, scallop stocks can be potentially overharvested by non-licensed crew and vessels, which could make landings in states other than Alaska. Under Alternatives 2 and 3, there will either be no fishing in the EEZ or Federal fishing permits will be required.

Because there is no regulation of non-State registered vessels, there will likely be significant biological impacts under Alternative 1 (Status Quo). The weathervane scallop stocks were apparently overfished in the early 1970's to the point that no landings were made in 1978. If effort and landings were allowed to increase, stocks could be subject to overfishing, with a resulting boom and bust fishing cycle. Other scallop populations around the world are vulnerable to overharvest, with slow stock recovery (Aschan 1991; Bannister 1986; Bourne 1986; McLoughlin et al. 1991; Orensanz 1986). Significant increases in Alaskan scallop harvests may jeopardize stock health and sustained fishery yield. The GHLs recently adopted by the State will restrict landings in the areas where GHLs are specified only for State registered vessels. For those areas without GHL's, landings may be restricted by State crab bycatch limits, and by the amount of effort in those areas only for State registered vessels.

Alternative 3 (Federalizing State Management) would address the problem of State Management not being able to control non-State registered vessels. State regulations would be reviewed for determination that they meet the criteria for inclusion in federal management and federal rules would be issued complementing State regulations.

Both direct and indirect sources of mortality should be considered in fishery management plans to ensure long-term maintenance of healthy scallop stocks and productive fisheries. By limiting the number and size of dredges, Alternative 3 would also limit mortality associated with the potential "inefficiency" of scallop dredges. Incidental mortality may occur by two mechanisms. One source of mortality is associated with the capture of small scallops that are handled and discarded at sea due to size regulations or economic considerations. Although many undamaged sea scallops that are quickly returned to the sea may experience no side effects (Naidu 1988), mortality may be significant when scallop catches containing rocks are dumped on a vessel's deck (Naidu 1988) or when scallops experience prolonged exposure to unfavorable on board conditions (Medcof and Bourne 1964), such as extreme air temperatures or prolonged desiccation. A submersible study of sea scallops from the Mid-Atlantic indicated low mortality (less than 10%) for scallops that were captured in dredges and discarded (NEFMC 1988). Mortality of undersized Atlantic sea scallops culled overboard was evaluated by Murawski and Serchuk (1989). In several controlled experiments, it was found that culling mortality for undersized scallops was probably no higher than 10%, at least over the short term (1-3 days) of the experiment. Gruffydd (1972) suggested that sand packing in scallop shells may injure the mantle tissues and perhaps cause significant delayed mortality. Shepard and Auster (1991) also discussed survivorship and pointed out that there may be substantial differences between mortality rates for very young scallops and older, legal sized, scallops. On the one hand, smaller scallops are more active and can potentially swim out of the way of an oncoming dredge (see Caddy 1968), but the youngest animals (spat) are attached to the substrate by byssal threads and would be extremely susceptible to dredging activity. A minimum ring size regulation greatly reduces the catch of small scallops, hence reducing discards and discard mortality (Kruse et al. 1993).

Several studies have addressed mortality of scallops not captured by dredges. In Australia, this type of fishing gear typically harvests only 5-35% of the scallops in their path, depending on dredge design, target species, bottom type, and other factors (McLoughlin et al. 1991). Of those that come in contact with the dredge but are not captured, some elude the passing dredge and recover completely from the gear interaction. Some injuries may occur during on board handling of undersized scallops that are returned to the sea or during gear interactions on the sea floor (Caddy, 1968; Naidu 1988; Caddy 1989), and delayed mortality can result from siltation of body cavities (Naidu 1988) or an increased vulnerability to disease (McLoughlin et al. 1991) and predation (Elner and Jamieson 1979). Caddy (1973) estimated incidental dredge mortality to be 13 to 17%, based on observations of broken and mutilated shells of Atlantic sea scallops. However, a submersible study of sea scallops from the Mid-Atlantic indicated that scallop dredges capture with high efficiency those scallops which are within the path of the scallop dredge and cause very low mortality among those scallops that are not captured (NEFMC 1988). Murawski and Serchuk (1989) made submersible observations of dredge tracks and found a much lower mortality rate (<5%) for Atlantic sea scallops. The difference in mortality between these two studies can be attributed to the substrate on which the experiments were conducted. Caddy's work was done in a sandy/gravelly area and Murawski and Serchuk worked on a smooth sand bottom. Shepard and Auster (1991) investigated the effect of different substrate types on dredge induced damage to scallops and found a significantly higher incidental damage on rock than sand, 25.5% versus 7.7%. For weathervane scallops, mortality is likely to be lower, as this species prefers smoother bottom substrates consisting of mud, clay, sand, or gravel (Hennick 1970a, 1973).

Atlantic sea scallop beds and the benthic community associated with scallop fishing grounds in the Bay of Fundy was assessed in 1969 (Caddy 1976). During the intervening years, the area has seen great changes in fishing pressure, with recent effort amounting to more than 90 vessels of over 25 GRT were continuously fishing the grounds with Digby drags for days at a time (Kenchington and Lundy 1991). Since 1969, there have also been dramatic fluctuations in scallop abundance, including both record highs and lows for this

century. In particular, scallop abundance rose to over 1000 times "normal" levels with the recruitment of two strong year classes in 1985 and 1986. This information indicates that extensive dredging does not impact the recruitment of scallops to a productive ground.

2.2 Potential Impacts on Benthic Communities and the Physical Environment

Determination of significance requires evaluation whether any fishery management plan or amendment may reasonably be expected to allow substantial damage to the ocean and coastal habitats (NOAA Administrative Order 216-6). Like the gear used to harvest aquatic resources, scallop dredges may have some potential to adversely affect other organisms comprising benthic communities. Potential effects of groundfish gear have been described in prior groundfish plan amendments (e.g., Amendment 18/23 NPFMC 1992, NPFMC 1993). Studies on the potential effects of trawling and dredging are summarized below.

An article from the January 1992 New Zealand Journal of Marine and Freshwater Research, titled "Environmental Impact of Trawling on the Seabed: A Review" (Jones 1992) attempts to review available knowledge on the subject of trawl impacts on the benthic environment. Evidence of trawling, such as furrows from the trawl doors, varies in its depth into the sea-floor and its duration depending upon the "softness" of the bottom being trawled. Potential effects of this bottom alteration are not directly addressed in this report. In terms of sediment re-suspension, the report notes that there are two facets to this issue: (1) increased, and usually temporary turbidity and (2) vertical redistribution of sediment layers. Both of these results of bottom disturbance by trawl gear were noted to vary in their duration, primarily dependent upon the depths at which they occurred. The report also concludes that "From the work performed under the aegis of ICES, it would appear that beam trawls, otter trawls, and dredges are all basically similar in their effects. Generally, the heavier the gear in contact with the seabed, the greater the damage. The effects vary greatly, depending on the amount of gear contact with the bottom, together with the depth, nature of the seabed, and the strengths of the currents or tides....The removal of the macrobenthos has variable effects. In shallow water areas where the damage is intermittent, recolonization soon occurs. However, where the macrobenthos is substantially removed and recovery is not permitted, the change is permanent....The evidence is that bottom trawling has an impact on the environment, but that the extent and duration of that impact varies depending on local conditions."

Other sources of information on the effects of trawling or dredging are limited. The Gulf of Alaska Groundfish FMP contains a section titled "Benthic habitat damage by fishing gear". The section concludes that "Any effect of gear dragged along the bottom depends on the type of gear, its rigging, and the type of bottom and its biota. In addition to the target species, the movement of a bottom trawl through an area primarily affects the slow-moving macrobenthic fauna such as seastars and sea urchins. Some bivalves can also be damaged. Although little is known of the effects of these disturbances and damages have on the affected species or their local communities, only minor impacts are suspected."

Effects of trawling were also summarized in a report by Natural Resource Consultants (1984) titled "Trawl Evaluation Study". The consensus of these investigators is that the overall effect of trawling on the sea bottom may not be harmful, and may, in fact, be beneficial. They found, for example, that trawl doors on sand and soft bottom stir up sand and silt which settle quickly. On muddy bottoms, the stirred up mud settles in a few hours, depending on the current speed and resulting turbulence near the bottom. Trawls have not been observed to kill flatfishes (directly). The damaged organisms, as well as the infauna which may have been dug up by the trawl are quickly preyed upon by fish and crabs. Several researchers observe that fishing by trawls with tickler chains has not resulted in any apparent effects on the sea bed or its biota."

A report prepared by the Washington Department of Fisheries (1985), titled "Final EIS for the Continued Harvest of Bottomfish in Puget Sound by Commercial Otter Trawl Gears", evaluates the potential adverse effects of otter trawl gear on the marine species, associated biota, marine substrate, water quality, and human activities. The EIS notes negative impacts of trawling including: disturbance of substrate such as otter board

tracks, silt suspension, shearing of eel grass and other large algae, some wastage of bottomfish and crab, and net negative impact on recreational bottomfish fisheries. In the conclusions section of the EIS, which addresses effects on long-term productivity, the document state that "Trawling does not cause permanent habitat damage. Biota potentially impacted by trawling show the capability to naturally repopulate a harvested area."

Based on the above trawl studies, any adverse effects of scallop dredges on benthic communities in Alaska are likely much lower in intensity than trawl gear. Although small amounts of coral are caught or damaged by groundfish trawls (NPFMC 1992a), distribution data and limited observer information suggest that little or none is taken by scallop dredges in Alaska. Generally, corals do not have the same habitat requirements as weathervane scallops. Most corals, such as fan corals, bamboo corals, cup corals, soft corals, and hydrocorals occur at greater depths than scallops. The two more abundant species of coral that live at similar depths as scallops occur in habitat consisting of boulders and bedrock, habitats that are not inhabited by most scallop species.

Similar to trawling, dredging may place fine sediments into suspension, bury gravel below the surface and overturn large rocks that are embedded in the substrate (NEFMC 1982, Caddy 1973). Dredging can also result in dislodgement of buried shell material, burying of gravel under re-suspended sand, and overturning of larger rocks with an appreciable roughening of the sediment surface (Caddy 1968). Observations of the Icelandic scallop fishery off Norway indicated that dredging changed the bottom substrate from shell-sand to clay with large stones within a 3-year period (Aschan 1991). For some scallop species, it has been demonstrated that dredges may adversely affect substrate required for settlement of young to the bottom (Fonseca et al. 1984; Orensanz 1986). Mayer et al. (1991), investigating the effects of a New Bedford scallop dredge on sedimentology at a site in coastal Maine, found that vertical redistribution of bottom sediments had greater implications than the horizontal translocation associated with scraping and ploughing the bottom. The scallop dredge tended to bury surficial metabolizable organic matter below the surface, causing a shift in sediment metabolism away from aerobic respiration that occurred at the sediment-water interface and instead toward subsurface anaerobic respiration by bacteria (Mayer et al. 1991). Dredge marks on the sea floor tend to be short-lived in areas of strong bottom currents, but may persist in low energy environments (Messieh et al. 1991).

Regulation of fishing season could be used to protect scallop during the spawning portions of their life cycle, and protect young during critical periods. Additionally, areas could be closed to dredging as necessary to protect important benthic communities. Weathervane scallops occur at depths ranging from intertidal waters to 300 m, with highest abundance at depths between 45 and 130 m on substrates consisting of mud, clay, sand, or gravel (Hennick 1970a, 1973). In addition to weathervane scallops, such substrates are likely to support populations of starfish, skates, crabs, snails, flatfish, and other groundfish species. Other scallop species are found in different habitats.

Alternative 3 to the status quo will reduce potential impacts of scallop dredging on benthic communities by limiting scallop dredges used in Alaska. In areas where GHL are specified, actual effort (number of tows) may not change; however, effort could increase in area where GHLs are unspecified. Limitations on dredge size will reduce the impact on benthic communities, as larger dredges weigh significantly more. Additionally, seasons could be set, and areas could be closed to dredging, if information indicated that such changes could be beneficial.

Based on the available information detailed above, the alternatives to the status quo are not reasonably expected to allow substantial damage to the ocean and coastal habitats (NOAA Administrative Order 216-6). Scallop dredges may have some potential, in some situations, to affect other organisms comprising benthic communities; however, these effects are not likely to be substantial for the relatively small scale scallop fisheries in Alaska, and may be much reduced under alternatives 2 and 3.

2.3 Potential Impacts on Bycatch of Non-target Species, and Catch of Allocated Groundfish.

As with trawl and other gear, scallop dredges have some potential to catch non-target species, particularly those that are slow moving or stationary. Limited data have been collected in past years on incidental catches of crab by dredges targeting weathervane and other scallop species, but the information remains confidential. In some areas, the catches of king and Tanner crabs may be high, and many captured crabs may be lethally damaged (Haynes and Powell 1968; Hennick 1973; Kaiser 1986). Some catches from scallop dredges contain small amounts of other species of crabs, shrimps, octopi, and fishes such as flatfishes, cod, and others (Hennick 1973, Kruse et al. 1993). Starfish, a scallop predator (Bourne 1991), was found to be the primary bycatch in weathervane scallop fisheries off Yakutat (Kruse et al. 1993). Seasonal and area-specific differences in bycatch rates exist. For example, in some areas incidental catches of king crabs may increase in spring as adult crabs migrate inshore for molting and mating, whereas other areas of dense scallop concentrations may possess few king crabs (Hennick 1973) and bycatch may be of little concern in these locations.

More recent bycatch data were collected during the 1993 ADF&G observer program (Urban et al. 1994). Nearly 900 days of scallop dredging were observed, comprising 12,881 hauls. By weight, the catch consisted of weathervane scallops (80.2%, starfish (12.6%), shells (6.5%), skates (2.1%), C. bairdi Tanner crab (1.6%), and arrowtooth flounder (1.2%). Flatfish and other invertebrate species comprised the remaining bycatch. No salmon bycatch was reported. Total bycatch of halibut ranged from less than 30 in Prince William Sound (Area E) to 1,750 in Kodiak (Area K). Total bycatch of Tanner crab in the 1993 scallop fishery was estimated to exceed 580,000 animals. Another 15,000 C. opilio snow crabs were captured. Estimated bycatch of red king crab was 200 or less in all registration areas.

Bycatch of Tanner crabs during the 1993 scallop fishery was analyzed in detail (Urban et al. 1994). Total Tanner crab bycatch varied widely between areas, ranging from 200 in Prince William Sound to 227,000 in the Bering Sea (Area Q). Crab bycatch consists primarily of small (<40 mm cw) immature Tanner crabs. Bycatch rates varied among vessels and areas fished, and ranged from zero to 2,600 crabs per tow-hour. Highest bycatch rates were associated with high scallop catch rates. New injuries were observed in 28% of the crabs sampled during the Shelikof scallop fishery. Approximately 13% of the Tanner crabs were recorded as dead or moribund before being discarded, with the highest mortality rates occurring on small (<40 mm cw) and large (>120 mm cw) crabs.

Other studies have also enumerated mortality and injury of crab taken as bycatch in the Alaska scallop fisheries. During a scallop survey of Cook Inlet in August 1984, a total of five red king crabs and more than 399 Tanner crabs were taken as bycatch in 47 tows (Hammarstom and Merritt 1985). Of the crab taken as bycatch, 19% of the Tanner crabs were injured and mortality was estimated at 8%, with most injuries and mortality occurring when the catch was dumped on deck (Hammarstom and Merritt 1985). Another scallop survey conducted around Kodiak Island in January 1968 had an unspecified bycatch (up to 33 per tow) of red king crabs, with an estimated mortality rate of 79% (Haynes and Powell 1968). Observations of the 1968-1972 scallop fishery around Kodiak Island indicated an average bycatch of 4.1 red king crab and 42.5 Tanner crab per tow (Kaiser 1986), with mortality estimated at 19% for Tanner crab and 48% for red king crab. An average of 0.6 Dungeness crabs per tow were also captured with mortality estimated to be 8%.

Bycatch of crab may vary by area, season, and depth. Off Yakutat, Hennick (1973) noted no king crab bycatch. Around Kodiak, king crab catches tended to increase in spring as adults migrated inshore for molting and mating (Hennick 1973). Consistent with other handling studies, newly molted crabs experience higher rates of injury and mortality than hard shelled crab, as a result of scallop dredges (Starr and McCrae 1983). Bycatch rates, injury rates, and mortality estimates do not take into account that scallop vessels dredge over the same bottom, tow after tow. Therefore, impacts of scallop fishing on crab bycatch may be overestimated in some situations.

Current regulations limit bycatch and interaction of crabs and the scallop fishery. King and Tanner crab bycatch limits for Alaskan scallop fisheries were instituted by the State in July, 1993. With the exception of Yakutat and Southeast areas, crab bycatch limits were specified for scallop fisheries in all registration areas. In addition, large areas in state and EEZ waters have been closed to scallop fishing, as these areas have showed high concentrations of crabs. However, unrestricted fishing by vessels not registered by the State could increase this bycatch under the status quo (State management).

Federal regulation of bycatch in the scallop fishery may also be considered under Alternative 3. Current regulations for the BSAI and GOA groundfish fisheries provide a number of regimes to manage the incidental take of prohibited species (PSC), or bycatch of Pacific halibut, Pacific herring, Pacific salmon, steelhead trout, and King and Tanner crab. One example of bycatch management is time and area closures triggered by attainment of an established PSC limit. PSC limits can be in the form of a percentage of biomass, such as herring in the BSAI, an established number, as with king and Tanner crab in the BSAI, or an estimated mortality rate, as with halibut in both the BSAI and GOA. Though salmon is classified as a PSC, and cannot be retained, it differs from other PSCs in that there is no limit on the number of salmon that can be incidentally taken in the groundfish fisheries. Another program established to address bycatch is the vessel incentive program (VIP) for the BSAI and GOA trawl fisheries. The Council also as recommended seasonal starting dates for some groundfish fisheries in order that the fisheries are conducted during a time of relatively lower bycatch rates.

Bycatch data collected by State observers in the 1993 scallop fishery (Urban et al. 1994) can be used to analyze bycatch rates of crabs and other species. During the 1993 BSAI scallop fishery (occurring over a 4 month period), a total of 10 vessels made 7,208 tows, to harvest 598,093 lb (271.3 mt) of scallop meat, with a bycatch of 276,500 Tanner crab and 212 king crab (Morrison 1994). On a rate basis, this equates to 83 lb (0.038 mt) of scallops and 38 Tanner crab per tow, or put another way, about 0.46 Tanner crabs per pound (1 Tanner crab per kilogram) of scallop meat harvested. At an average exvessel price of $6.02 per pound for scallops, gross exvessel value was $500 per tow. Bycatch rates varied greatly among vessels fishing in the 1993 Bering Sea scallop fishery (Urban et al. 1994). Catch of Tanner crabs per tow-hour ranged from 17 crabs to 203 crabs per tow-hour (median=53, mean=90). Length frequency of Tanner crabs taken as bycatch was not reported, but likely consisted primarily of small juvenile crab.

One positive benefit resulting from the status quo (State of Alaska management) is the state's ability to enact 'hotspot' authority and close a fishery or an area of a fishery in real time if in-season monitoring indicates that high bycatch of a PSC is occurring in the scallop fishery. Under federal regulations, true 'hotspot' authority is not at this time possible due to the inability of NMFS to utilize discretionary authority.

Fisheries for groundfish species are not expected to be adversely affected under any alternative. Under Alternative 3 (Federalizing State Regulations) observer data would provide information on bycatch rates of crabs, halibut, and other groundfish.

Given the best available information, as summarized above, implementation of the proposed scallop fishery management plan is not reasonably expected to jeopardize the long-term productive capability of crab, herring, or groundfish stocks.

2.4 Potential Impacts on Pacific Salmon Listed Under the Endangered Species Act (ESA)

Five species of Pacific salmon occur off Alaska and these are: chinook salmon, Oncorhynchus tschawytscha; coho salmon, O. kisutch; sockeye salmon, O. nerka; chum salmon O. keta; and pink salmon O. gorbuscha. Of these species, several populations have been listed or are being considered for listing under the ESA. Snake River sockeye were listed as endangered (November 20, 1991), and Snake River spring/summer and fall chinook are listed as threatened (56 FR 29542, June 21, 1991; 57 FR 14653, April 22, 1992). A fourth species,

winter-run chinook from the Sacramento River, was listed as threatened on November 5, 1990, and is proposed to be listed as endangered (57 FR 27416 June 19, 1992), but is almost unknown in Alaskan waters.

Although listed wild fish are not marked or directly identifiable, tagged hatchery fish from nearby locations have been used as indicators of the distribution of listed species. Coded wire tag (CWT) recovery data from observed groundfish fisheries suggests that the ocean distribution of these fish may extend into the GOA and BSAI, although their occurrence in these areas would be extremely rare. Bycatch of any sockeye salmon is extremely rare in the groundfish fisheries. Since 1981, no indicator sockeye, or Sacramento River chinook salmon, and only one CWT indicator chinook from the Snake River has been recovered in the GOA groundfish fishery, and none have been recovered in the BSAI groundfish fisheries.

Capture of salmon by the scallop dredges is reported to be rare (Hennick 1973), as scallop dredges are small in size, and remain within one meter of the ocean bottom. Bycatch of all fish species by scallop dredges is composed primarily of flounders and skates (Kruse et al. 1993; Urban et al. 1994). No salmon bycatch was reported during the 1993 ADF&G observer program, with nearly 900 days fishing observed (Urban et al. 1994). Thus, the Alaskan scallop fishery is not likely to jeopardize the continued existence of listed species of Pacific salmon, or result in disturbance or adverse modification of habitat critical of these species. Alternative 2 (*preferred*) (Closure of the EEZ) will not affect endangered or threatened salmon or their critical habitat, as there would be no scallop fishery. A Section 7 consultation under the ESA has not been proposed for the scallop fisheries, as interactions with Pacific salmon are likely to be extremely rare. No adverse effects on listed species of Pacific salmon are expected under the other alternatives.

2.5 Potential Impacts on Seabirds

Many seabirds occur in Alaskan waters that are fished for scallops. The most numerous seabirds in Alaska are northern fulmars, storm petrels, kittiwakes, murres, auklets, and puffins. These groups, and others, represent 38 species of seabirds that breed in Alaska. Eight species of Alaska seabirds breed only in Alaska and in Siberia. Populations of five other species are concentrated in Alaska but range throughout the North Pacific region. Marine waters off Alaska provide critical feeding grounds for these species as well as others that do not breed in Alaska but migrate to Alaska during summer, and for other species that breed in Canada or Eurasia and over-winter in Alaska. Additional discussion about seabird life history, predator-prey relationships, and interactions with the groundfish fishery can be found in an EA prepared for the 1995 Groundfish Total Allowable Catch Specifications (NMFS 1995). None of these bird species prey on scallops.

A formal and informal consultation conducted by the U.S. Fish and Wildlife Service (USFWS) on the potential impacts of groundfish fisheries and a subsequent amendment to the formal consultation on impacts of 1995 groundfish fisheries on these seabird species concluded that groundfish fisheries adversely affect, but do not jeopardize, the existence of the short-tailed albatross (USFWS 1989, 1994, 1995) if the incidental take allowance of up to two short-tailed albatrosses per year was not exceeded. The previous informal consultations also concluded that groundfish fisheries were not likely to adversely affect the spectacled eider, Steller's eider, or marbled murrelet. The USFWS did not comment on remaining candidate species at that time. To date, no observations have been reported of interactions with seabirds and the scallop fishery. Alternative 2 (*preferred*) (Closure of the EEZ) will not affect endangered or threatened seabirds or their critical habitat, as there would be no scallop fishery. No Section 7 consultation under the ESA has been proposed for the scallop fisheries, as interactions with seabirds in the scallop fishery are thought to be rarer that with the groundfish fishery, which consists of a much larger fleet of vessels using large nets or baited hooks or pots. None of the alternatives are expected to adversely affect any listed seabird in a manner not already considered in previous consultations.

The following summarizes the status of seabirds currently listed, proposed to be listed, or which are candidates for listing, under the ESA:

Status	Category	Species
Listed	Endangered	Short-tailed albatross (Diomedea albatrus)
5/92 Proposed	Threatened	Spectacled Eider (Somateria fischeri)
Candidate	Category 1	Steller's eider (Polysticta stelleri)
Candidate	Category 2	Marbled murrelet (Brachyramphus marmoratus)
1993 Candidate	Category 2	Red-legged kittiwake (Rissa brevirostris)
1993 Candidate	Category 2	Kittlitz's murrelet (Brachyramphus brevirostris)
Listed	Endangered	Peregrine falcon (Falco peregrinus anaturm)

2.6 Potential Impacts on Marine Mammals

Cetacean and pinniped species are unlikely to have potential for interaction with scallop fisheries in the GOA and BSAI. There are seven cetacean species listed as endangered under the ESA [fin whale (Balaenoptera physalus), sei whale (Balaenoptera borealis), humpback whale (Megaptera novaeangliae), northern right whale (Balaena glacialis), blue whale (Balaenoptera musculus), gray whale (Eschrichtius robustus), and sperm whale (Physeter macrocephalus)]. There are also three pinniped species in the GOA and BSAI where scallop fishing occurs. These pinniped species [Steller sea lions (Eumetopias jubatus), northern fur seals (Callorhinus ursinus), Pacific harbor seals (Phoca vitulina)] have experienced declines in their population sizes over the last 30 years. The Steller sea lion was listed as threatened under the ESA in 1990. An informal consultation pursuant to Section 7 of the ESA for the 1995 groundfish fisheries was held under the BSAI and GOA FMP for the Steller sea lion on February 3, 1995 (NMFS 1995). Alternative 2 (*preferred*) (Closure of the EEZ) will not affect endangered or threatened marine mammals or their critical habitat, as there would be no scallop fishery. No consultation has been proposed for the scallop fisheries, as interactions with Steller sea lions and other pinnipeds, and sea otters are likely to be rare. Hence, no adverse effects on listed species of marine mammals are expected under any of the alternatives.

Marine mammals not listed under the ESA that may be present in the BSAI or GOA include cetaceans, [minke whale (Balaenoptera acutorostrata), killer whale (Orcinus orca), Dall's porpoise (Phocoenoides dalli), harbor porpoise (Phocoena phocoena), Pacific white-sided dolphin (Lagenorhynchus obliquidens), and the beaked whales (e.g., Berardius bairdii and Mesoplodon spp.)] as well as pinnipeds [northern fur seals (Callorhinus ursinus), and Pacific harbor seals (Phoca vitulina)] and the sea otter (Enhydra lutris). A list of species and detailed discussion regarding life history and potential impacts of the 1995 groundfish fisheries of the BSAI and GOA on those species can be found in an EA conducted on the 1995 Total Allowable Catch Specifications for the GOA and BSAI (NMFS 1995). Alternative 3 is not expected to adversely affect any listed or candidate marine mammals in a manner not already considered in previous consultations.

2.7 Coastal Zone Management Act

Each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

2.8 Conclusions and Impact of the Proposed Action Relative to Endangered and Threatened Species and the Alaska Coastal Zone

Species that are listed, or proposed to be listed, under the Endangered Species Act (ESA)that may occur in the BSAI or GOA include the endangered fin whale (Balaenoptera physalus); sei whale (Balaenoptera borealis); humpback whale (Megaptera noveangliae); sperm whale (Physeter catodon); Snake River sockeye salmon (O. nerka) and short-tailed albatross (Diomedea albatrus); the threatened Steller sea lion (Eumetopias jubatus);

Snake River fall and spring-summer chinook salmon (Oncorhynchus tshawytscha); and spectacled eider (Somateria fischeri). In summary, listed species of salmon, seabirds, and whales under the ESA will not be affected by the proposed alternative.

Each of the alternatives discussed above would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

None of the alternatives are likely to significantly affect the quality of the human environment; preparation of an environmental impact statement for selection of any of the alternatives as the proposed action would not be required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

2.9 Finding of No Significant Impact

For the reasons discussed above, implementation of any one of the alternatives to the status quo would not significantly affect the quality of the human environment, and the preparation of an environmental impact statement on the final action is not required under Section 102(2)(c) of the National Environmental Policy Act or its implementing regulations.

_____ _____

Date

3.0 REGULATORY IMPACT REVIEW: ECONOMIC AND SOCIOECONOMIC IMPACTS OF THE ALTERNATIVES

This section provides information about the economic and socioeconomic impacts of the alternatives including identification of the individuals or groups that may be affected by the action, the nature of these impacts, quantification of the economic impacts if possible, and discussion of the trade-offs between qualitative and quantitative benefits and costs.

This section also addresses the requirements of both E.O. 12866 and the RFA to provide adequate information to determine whether an action is "significant" under E.O. 12866 or will result in "significant" impacts on small entities under the RFA. Requirements of the RFA are addressed in Section 4.

The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the Order:

> In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

Executive Order 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant". A "significant regulatory action" is one that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

2. create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

3. materially alter the budgetary impacts of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

4. raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in Executive Order 12866.

A regulatory program is "economically significant" if it is likely to result in effects described in item (1) above. The RIR is designed to provide information to determine whether the proposed regulation is likely to be "economically significant".

3.1 Economic Status of the Fishery

Interest in an Alaskan scallop fishery has existed since the early 1950's when the Bureau of Commercial Fisheries began systematic surveys to determine if commercial quantities were available. The first commercial deliveries of weathervane scallops were made in 1967. Since then, the numbers of vessels, numbers of landings and harvest (weight of shucked meats) have varied annually (Table 3.1.1). Total commercial harvest of scallops has fluctuated from a high of 157 landings totalling 1,850,187 lb (839.2 mt) of shucked meats by 19 vessels in 1969 to no landings in 1978. Prices and demand for scallop have remained high since fishery inception. Harvests in 1990 and 1991 were the highest on record since the early 1970's (Figure 1). The 1992 harvest was even higher at 1,810,788 lb (821.4 mt). On average, about two-thirds of the scallop harvest has been taken off Kodiak Island and about one-third has come from the Yakutat area; other areas have made minor contributions to overall landings. Harvest peaks have occurred as new beds were discovered or old beds recovered and then became depleted (Table 3.1.2). Landings from State waters have historically comprised about 39 percent of the total (Figure 2), but more recent landings have been taken almost exclusively from EEZ waters. Only 14 percent of 1994 landings were from State waters (Ken Griffin, ADF&G, personal communication). Changes in catch-per-unit-effort (CPUE) could not be monitored, as the unit measure of effort (number of days as measured by trips) has not been consistent through the time series. Many vessels switched from landing fresh to frozen product during the late 1980's, extending the average trip from about 10 days to perhaps 20 or more.

The size of the scallop fishing fleet off Alaska has fluctuated since the fishery began in 1967. Since then, up to 19 vessels per year have participated in the fishery. In 1992, only seven vessels were actively fishing for scallops. Annual variability in the number of participants is due to both scallop abundance and the potential revenues generated by other fisheries (Kaiser 1986; Bourne 1991). Historically, many of the vessels participating in the fishery have dropped out after only 1 year (Table 3.1.3). By 1992, only one vessel had participated for more than 4 consecutive years. Examination of the number of landings made by vessels indicates that the 1992 participants were "full time" scallopers, whereas vessels may have fished part time for scallops in previous years (Table 3.1.4). Examination of the number of months in which scallop landings were made also indicates that the vessels fishing in 1992 were full time participants (Table 3.1.5). Since the beginning of the fishery, scallops have been harvested by vessels and companies from the East Coast (Browning 1980). The same situation occurred through 1993 and 1994; of the 26 individuals permitted to fish for scallops in 1993, 16 were issued to addresses in Alaska, and 10 outside the State, primarily from the mid-Atlantic area. Of 16 vessels fishing in 1994, seven were homeported in Alaska, three in Seattle, and six on the East Coast. Eleven of these vessels landed only scallops (Ken Griffin, ADF&G, personal communication). No foreign vessels have ever participated in the scallop fishery in Alaska, and no Indian treaty fishing rights exist for this fishery.

Throughout the history of the Alaska scallop fishery, vessels fished nearly exclusively for weathervane scallops. Although scallop fisheries could potentially target species other than weathervanes, they have not done so. Landings of other scallop species were made by one vessel in 1991 and 1992, but due to confidentiality of the data, total landings of other species cannot be reported. Landings of other scallops may have been made in earlier years, but scallop species were not differentiated on fish tickets prior to 1991. Apparently, some amount of pink scallops were landed in 1979 (Kaiser 1986). Little information on the abundance and distribution of these other species is available. It is not known to what extent the scallop species are harvested by recreational or subsistence fisheries, however based on anecdotal information, some recreational diving for pink scallops occurs in Southeast Alaska.

Currently, the "average" scallop vessel is about 90-110 ft long and carries a crew of 12. In the 1980's, several small (< 50 ft) vessels participated in the fishery. The length distribution of vessels participating in the scallop fishery since 1980 is shown in Table 3.1.6. The gear used to catch scallops commercially is the dredge of a standard design, with a regulated minimum ring size (Figure 3). This type of fishing gear typically harvests only 5-35% of the scallops in their path, depending on dredge design, target species, bottom type, and other

factors (McLoughlin et al. 1991). Although dredge width has varied in size through the history of the fishery, recent State regulations have limited dredges to a maximum width of 15 feet. Traditionally, scallops have been processed at sea by manual shucking, with only the meats (adductor muscles) landed. The technology for automated mechanical shucking exists, and apparently can process Alaskan scallops. However, this type of shucking was recently prohibited by the State for weathervane scallops and in the East Coast sea scallop fishery to control effort.

Fishing operations at sea generally involve the following steps: (1) Dredge setting, (2) towing for about one hour, (3) dredge retrieval, (4) dumping of the catch on deck, (5) sorting out scallops to be retained, and (6) discarding of debris, small scallops and bycatch of other species. Retained scallop are shucked the crew, and usually washed, sorted, and frozen (or iced) at sea. DuPaul and Carnegie (1994) reported on scallop fishing procedures during the weathervane scallop fishery off Yakutat in July 1993. They reported that fishermen generally retained most large scallops (> 85 mm SH). Small scallops (< 85 mm SH) comprised a very small percentage (< 5%) of the catch, and were not retained. Scallops in the 100-130 mm SH range comprised the vast majority of the catch, corresponding to meat counts of 28 to 48 meats per pound of shucked adductor muscles. In the 1993 scallop fisheries statewide, the largest scallops were taken in the Kodiak Island and Bering Sea (Figures 4 and 5).

Economic trends of the fishery depend upon the performance measures considered. For example, vessels averaged 212,000 lb (96.2 mt) each during the early "fishing-up period" (1970-1973) of the fishery. During 1974-1986, landings per vessel averaged only about one-third (66,000 lb (29.9 mt)) of the 1970-1973 average as stocks recovered from high harvest levels, but increased to about one-half (114,000 lb (51.7 mt)) of the original level during the 1987-1991 period. Note that the average landings per vessel in 1992 (258,684 lb (117.3 mt)) was the highest in the history of the fishery (Table 3.1.1). On the other hand, average gross receipts (exvessel value) per vessel reveal a different trend due to price effects during these same three time periods: $234,000, $178,000, and $453,000, respectively.

Average annual exvessel price has increased through the time series, with a distinct break occurring between 1975 and 1980 (Table 3.1.1). In the early years of the fishery, 1968-1975, exvessel price per pound ranged from $0.85 to $1.40. Prices in the early 1980's were much higher, with exvessel prices ranging from $3.77 to $4.88. Prices have decreased somewhat since then, with a range of $3.12 to $3.88 observed from 1985 to 1991. Although exvessel prices for Atlantic sea scallops (a substitute product for weathervanes) have been considerably higher in 1992 through 1994, these differences may be due in part to a practice of soaking scallops in fresh water containing sodium tri-poly phosphate (STP), which can increase scallop weight by up to 30% (Bill DuPaul, VIMS, personal communication 7/15/93).

Table 3.1.1. Historic number of vessels, number of landings, landed weight of shucked meats, price per pound, exvessel value, landings per vessel, and exvessel value per vessel for the weathervane scallop fishery in Alaska during 1967-1994. All data for 1967-1968, and prices and exvessel values for 1967-1975 and 1979 were taken from Kaiser (1986); all other data were summarized from fish tickets (Kruse 1994). The 1994 data are preliminary. In years when only one or two vessels participated in a fishery, the harvest statistics are confidential.

Year	No. of Vessels	No. of Landings	Landings Wt. (lbs)	Price ($/lb)	Exvessel Value ($)	Landings (lbs) per Vessel	Value ($) per Vessel
1967	<----------Confidential---------->						
1968	19	125	1,677,268	0.85	1,425,678	88,277	75,036
1969	19	157	1,850,187	0.85	1,572,659	97,378	82,772
1970	7	137	1,440,338	1.00	1,440,338	205,763	205,763
1971	5	60	931,151	1.05	977,709	186,230	195,542
1972	5	65	1,167,034	1.15	1,342,089	233,407	268,418
1973	5	45	1,109,495	1.20	1,331,394	221,881	266,279
1974	<----------Confidential---------->						
1975	4	56	435,672	1.40	609,941	108,918	152,485
1976	<----------Confidential---------->						
1977	<----------Confidential---------->						
1978	0	0	0	-	0	0	0
1979	<----------Confidential---------->						
1980	8	56	632,535	4.32	2,732,551	79,06,7	341,569
1981	18	101	924,441	4.05	3,743,986	51,358	207,999
1982	13	120	913,996	3.77	3,445,765	70,307	265,059
1983	6	31	194,116	4.88	947,286	32,353	157,881
1984	10	61	389,817	4.47	1,742,482	38,982	174,248
1985	8	53	647,679	3.12	2,020,758	80,599	252,595
1986	9	86	682,622	3.66	2,498,397	75,847	277,600
1987	4	55	583,043	3.38	1,970,685	145,761	492,671
1988	4	47	341,070	3.49	1,190,334	85,268	297,584
1989	7	54	525,598	3.68	1,934,201	75,085	276,314
1990	9	144	1,488,64	3.37	5,016,724	165,405	557,414
1991	7	144	1,191,014	3.76	4,478,213	170,145	639,745
1992	7	137	1,810,788	3.88	7,028,702	258,684	1,004,100
1993	15	155	1,428,976	5.00	7,144,880	95,265	476,325
1994	16	118	1,235,267	6.00	7,411,614	77,204	463,226

Table 3.1.2 Landings of scallops by year, registration area, and species, 1980-1994.

		Weathervane Scallops		Pink Scallops		Annual Totals	
		Pounds	Vessels	Pounds	Vessels	Pounds	Vessels
Year	Registration Area						
1980	(A) Southeastern Alaska	*	2	0	0	*	2
	(D) Yakutat	**	6	0	0	**	6
	(K) Kodiak	371,018	7	0	0	371,018	7
	All Areas	632,535	8	0	0	632,535	8
1981	(A) Southeastern Alaska	*	1	0	0	*	1
	(D) Yakutat	**	10	0	0	**	10
	(K) Kodiak	460,890	15	0	0	460,890	15
	All Areas	924,441	18	0	0	924,441	18
1982	(A) Southeastern Alaska	*	3	0	0	*	3
	(D) Yakutat	168,353	6	0	0	168,353	6
	(K) Kodiak	435,802	8	0	0	435,802	8
	(M) Alaska Peninsula	205,534	6	0	0	205,534	6
	(O) Dutch Harbor	**	5	0	0	**	5
	All Areas	913,996	13	0	0	913,996	13

1983	(A) Southeastern Alaska	*	1	0	0	*	1
	(K) Kodiak	**	4	0	0	**	4
	(M) Alaska Peninsula	*	1	0	0	*	1
	(H) Cook Inlet	*	1	0	0	*	1
	All Areas	194,116	6	0	0	194,116	6
1984	(D) Yakutat	*	2	0	0	*	2
	(K) Kodiak	309,502	6	0	0	309,502	6
	(H) Cook Inlet	*	3	0	0	*	3
	All Areas	389,817	9	0	0	389,817	9

* Confidential data

** Data masked to prevent extraction of confidential data

Table 3.1.2 (continued)

		Weathervane Scallops		Pink Scallops		Annual Totals	
		Pounds	Vessels	Pounds	Vessels	Pounds	Vessels
Year	Registration Area						
1985	(D) Yakutat	14,221	4	0	0	14,221	4
	(K) Kodiak	*	3	0	0	*	3
	(M) Alaska Peninsula	*	1	0	0	*	1
	(O) Dutch Harbor	*	3	0	0	*	3
	(H) Cook Inlet	*	1	0	0	*	1
	All Areas	647,679	8	0	0	647,679	8
1986	(D) Yakutat	*	2	0	0	*	2
	(K) Kodiak	180,600	5	0	0	387,209	5
	(O) Dutch Harbor	387,209	5	0	0	387,209	5
	(H) Cook Inlet	*	3	0	0	*	3
	(Q) Adak - Bristol Bay - Bering Sea	*	1	0	0	*	1
	All Areas	682,622	9	0	0	682,622	9

1987	(D) Yakutat	*	1	0	0	*	1
	(K) Kodiak	*	3	0	0	*	3
	(O) Dutch Harbor	*	2	0	0	*	2
	(H) Cook Inlet	*	1	0	0	*	1
	(Q) Adak - Bristol Bay - Bering Sea	*	2	0	0	*	2
	All Areas	583,043	4	0	0	583,043	4
1988	(D) Yakutat	*	1	0	0	*	1
	(K) Kodiak	*	3	0	0	*	3
	(M) Alaska Peninsula	*	1	0	0	*	1
	(O) Dutch Harbor	*	1	0	0	*	1
	All Areas	341,070	4	0	0	341,070	4

* Confidential data
** Data masked to prevent extraction of confidential data

Table 3.1.2 (continued)

		Weathervane Scallops		Pink Scallops		Annual Totals	
		Pounds	Vessels	Pounds	Vessels	Pounds	Vessels
Year	Registration Area						
1989	(D) Yakutat	*	1	0	0	*	1
	(K) Kodiak	**	5	0	0	**	5
	(O) Dutch Harbor	*	1	0	0	*	1
	All Areas	534,763	7	0	0	534,763	7
1990	(A) Southeastern Alaska	**	4	0	0	**	4
	(D) Yakutat	442,310	8	0	0	442,310	8
	(K) Kodiak	697,003	7	0	0	697,003	7
	(M) Alaska Peninsula	*	2	0	0	*	2
	(O) Dutch Harbor	*	1	0	0	*	1
	(Q) Adak - Bristol Bay - Berng Sea	*	1	0	0	*	1
	All Areas	1,488,642	9	0	0	1,488,642	9

1991	(A) Southeastern Alaska	*	3	0	0	*	3
	(D) Yakutat	402,571	5	0	0	402,571	5
	(K) Kodiak	514,348	4	0	0	514,348	4
	(M) Alaska Peninsula	*	1	0	0	*	1
	(O) Dutch Harbor	*	1	*	1	*	2
	(Q) Adak - Bristol Bay - Bering Sea	*	3	*	1	125,523	4
	All Areas	1,136,713	7	*	1	1,191,014	8
1992	(A) Southeastern Alaska	*	1	0	0	*	1
	(D) Yakutat	1,020,968	7	0	0	1,020,968	7
	(K) Kodiak	*	3	0	0	*	3
	(O) Dutch Harbor	*	1	*	1	*	1
	(E) Prince William Sound	208,836	4	0	0	208,836	4
	All Areas	1,741,578	7	*	1	1,810,788	7

* Confidential data
** Data Marked to precent extraction of confidential data

Table 3.1.2 (continued)

		Weathervane Scallops		Pink Scallops		Annual Totals	
		Pounds	Vessels	Pounds	Vessels	Pounds	Vessels
Year	Registration Area						
1993	(Q) Bering Sea	531,668	9	0	0	531,668	9
	(D) Yakutat	256,493	10	0	0	256,493	10
	(K) Kodiak	374,908	10	0	0	374,908	10
	All Areas	1,428,976	15	0	0	1,428,976	15
1994	(Q) Bering Sea	505,439	9 . .	0	0	505,439	9
	(D) Yakutat	259,206	12	0	0	259,206	12
	(K) Kodiak	381,850	10	0	0	381,850	10
	All Areas	1,235,269	17	0	0	1,235,269	17

* Confidential data

** Data masked to prevent extraction of confidential data.

Table 3.1.3 Number of vessels participating in the scallop fishery 1980-1992, by the number of years participating.

Number of Years Participating

Year	1	2	3	4	5	6	7	8	9	10	11	12	13
1980	8	0	0	0	0	0	0	0	0	0	0	0	0
1981	13	5	0	0	0	0	0	0	0	0	0	0	0
1982	4	6	3	0	0	0	0	0	0	0	0	0	0
1983	4	0	1	1	0	0	0	0	0	0	0	0	0
1984	4	2	1	1	1	0	0	0	0	0	0	0	0
1985	6	0	1	0	1	1	0	0	0	0	0	0	0
1986	5	2	0	0	0	1	1	0	0	0	0	0	0
1987	0	2	0	1	0	0	0	1	0	0	0	0	0
1988	1	0	2	0	0	0	0	0	1	0	0	0	0
1989	3	2	0	1	0	0	0	0	0	1	0	0	0
1990	2	3	2	0	1	0	0	0	0	0	1	0	0
1991	3	0	2	1	0	1	0	0	0	0	0	1	0
1992	1	2	0	2	1	0	0	0	0	0	0	0	1

Note: No vessels fished in 1978, and only two fished in 1979; of these, one fished for only 1 year, and one fished through 1982.

Table 3.1.4 Number of vessels participating in the scallop fishery 1980-1992, by landings category.

Number of Landings Per Vessel

Year	1-5	6-10	11-15	16-20	21-25	26-30
1980	4	2	1	0	1	0
1981	12	3	2	1	0	0
1982	5	2	5	0	1	0
1983	5	0	0	0	1	0
1984	6	1	0	0	2	0
1985	7	0	0	2	0	0
1986	3	3	1	2	0	0
1987	1	2	0	0	0	1
1988	2	0	1	0	1	0
1989	3	3	0	1	0	0
1990	1	3	2	1	1	1
1991	1	1	3	1	2	0
1992		1	2	3	1	0

Table 3.1.5 Number of vessels participating in the scallop fishery 1980-1992, by the number of months with scallop landings.

	Year											
	1980		1981		1982		1983		1984		1985	
	Vessels	Percent	Vessels	Percent	Vessels	Percent	Vessels	Percent	Vessels	Percent	Vessels	Percent
Months With Landings												
1	2	25.0	2	11.1	1	7.7	5	83.3	4	44.4	4	44.4
2	1	12.5	8	44.4	2	15.4	0	0	3	33.3	1	11.1
3	2	25.0	1	5.6	0	0	0	0	0	0	2	22.2
4	1	12.5	3	16.7	3	23.1	0	0	0	0	0	0
5	0	0	0	0	1	7.7	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	1	12.5	2	11.1	3	23.1	0	0	0	0	0	0
8	0	0	1	5.6	1	7.7	0	0	0	0	0	0
9	0	0	0	0	1	7.7	0	0	0	0	1	11.1
10	0	0	0	0	1	7.7	0	0	0	0	1	11.1
11	0	0	0	0	0	0	0	0	1	11.1	0	0
12	1	12.5	1	5.6	0	0	1	16.7	1	11.1	0	0
Year Totals	8	100.0	18	100.0	13	100.0	6	100.0	9	100.0	9	100.0

Table 3.1.5 (continued)

	Year													
	1986		1987		1988		1989		1990		1991		1992	
	Vessels	Percent	Vessels	Percent	Vessels	Percent	Vessels	Percent	Vessels	Percent	Vessel	Percent	Vessels	Percent
Months With Landings														
1	0	0	0	0	2	50.0	0	0	0	0	1	12.5	0	0
2	2	22.2	1	25.0	0	01.1	2	28.6	1	11.1	0	0	0	0
3	1	11.1	0	0	0	0	1	14.3	0	0	0	0	0	0
4	2	22.2	0	0	0	0	2	28.6	0	0	1	12.5	0	0
5	1	11.1	1	25.0	1	25.0	0	0	0	0	0	0	1	14.3
6	0	0	0	0	0	0	1	14.3	1	11.1	1	12.5	0	0
7	1	11.1	0	0	0	0	0	0	1	11.1	0	0	2	28.6
8	0	0	0	0	0	0	0	0	4	44.4	0	0	0	0
9	2	22.2	1	25.0	0	0	0	0	0	0	2	25.0	0	0
10	0	0	0	0	0	0	0	0	1	11.1	1	12.5	2	28.6
11	0	0	0	0	0	0	0	0	1	11.1	1	12.5	2	28.6
12	0	0	1	25.0	1	25.0	1	14.3	0	0	1	12.5	0	0
Year Totals	9	100.0	4	100.0	4	100.0	7	100.0	9	100.0	8	100.0	7	100.0

Table 3.1.6. Number of vessels participating in the scallop fishery 1980-1992, by vessel length category.

Length Category (ft)

Year	<50	50-70	71-90	91-110	111-130	131-150	>150
1980	0	1	5	2	0	0	0
1981	0	2	11	4	0	1	0
1982	2	0	8	3	0	0	0
1983	4	0	1	1	0	0	0
1984	4	2	1	2	0	0	0
1985	3	1	1	3	0	0	0
1986	3	0	1	3	1	1	0
1987	1	0	0	2	0	1	0
1988	0	0	1	2	0	1	0
1989	0	1	2	3	1	0	0
1990	0	1	2	5	1	0	0
1991	0	1	1	1	2	1	1
1992	0	1	2	1	1	1	1
1993	0	3	8	2	1	1	0
1994	0	4	8	2	1	1	0

Note: **Prior to 1980, nearly all vessels were 70-90 ft.**
One missing vessel in 1987.

3.2 Potential Impacts of Continuing the Status Quo

Projected Effort

A total of 15 vessels made scallop landings in 1993, including six of the seven that made landings in 1992. Of the 1993 participants, three made landings only from the Cook Inlet registration area. The other 12 participants did not participate in the Cook Inlet fishery, and made landings only from other areas. In 1994, 16 vessels made scallop landing. Were fishing continued to be unrestricted in the EEZ, some of these vessels would likely forgo their State registration and crew licenses to fish exclusively in the EEZ. Additional scallop vessels from the East Coast or elsewhere may also enter the fishery.

Overcapitalization

From the perspective of the individual fisherman, net returns decline as the vessel's share of the quota decreases due to increased fishing pressure and shorter seasons. Capitalization of the fishery continues beyond an efficient level because fishermen do not bear the entire social cost of the fishery resource. The resource is owned by the public, and although it has some value, fisherman are allowed to take the fish for free. This encourages capitalization beyond the level of operation that would exist if fishermen had to incur the cost or value society places on the fish. Effort continues to increase in the fishery beyond an efficient or profitable fleet size until average net returns reach or fall below zero. The cumulative effect is a fleet that dissipates net economic value and perpetuates low incomes in the fishery. The overcapitalized fleet also represents an unnecessarily large and unproductive share of the economy's capital investment base. This condition of overcapitalization prevents achievement of OY from the fishery to the extent that economic rents are lower than those achievable, and overall capital costs in the fishery are higher than required. The status quo will perpetuate these inefficiencies.

Retaining the status quo in the scallop fishery to allow an unrestricted fishery in the EEZ, would encourage overcapitalization and, with it, overfishing. The lack of regulation in the EEZ would encourage those vessels currently present in the area and rigged for scallops to participate full time in the fishery without the effort-restricting gear currently required by the State. Fishing longer with bigger crews and possibly with automatic shucking machines would create a short-term incentive for those boats to increase their catches. Unemployed scallop vessels from the East Coast would likely be encouraged to make the trip to Alaska to take part in such a fishery. Under Amendment #4 of the Atlantic Sea Scallop FMP (NEFMC 1993), 34 vessels that derived at least 85% of their income from sea scallops in 1991, will not qualify under the Atlantic Sea Scallop moratorium (Lou Goodreau, NEFMC staff, personal communication).

Projected Landings

The number of vessels which would participate in an unrestricted fishery would depend on expected landings and perceived profits in future years. Based on past landings of weathervane and other scallop species, a possible 1.8 million lb (816 mt) in landings (the 1992 recent record harvest) is expected annually for the near term if the fishery remains unrestricted. These landings were estimated by assuming a major portion of the fleet over 80 feet (11 vessels) fishing in 1994 would opt to fish exclusively in the EEZ and that the fleet would augmented by new entrants. This estimate is low in that the previous record was taken by only seven vessels. Catches initially could be greater, but would probably drop off as the most accessible scallop beds were fished out. This contrasts with desired Statewide upper bound expected landings of about 1.3 million lb (590 mt).

Projected Prices

Exvessel prices received in 1993 ranged from $4.76 to $6.65 per pound of shucked meat. The 1993 and 1994 averages are $5.00 and $6.00 per lb respectively. These prices were higher than those historically paid for

Alaskan scallops. Exvessel price ranged from $3.12 to $4.88 per pound from 1980-1992 (Table 3.1.1). For example, if future exvessel prices were in the order of $7.00 per pound, the value of 1.8 million lb of scallop meats would be $12.6 million.

This analysis assumed that the fishery will occur year-round. Both fixed and operating costs are reduced when the fishery is limited by short seasons, as vessels can tie up to the dock. In fact, some vessels were not able to operate in all months during the 1993 fishery.

3.3 Potential Impacts of Adopting an FMP Which Closes the EEZ

Closure of the EEZ to fishing for scallops would cause substantial impact to participants in the Alaskan scallop fisheries. Of the 16 vessels making landings of scallops in 1994, 11 vessels landed no other catch (Ken Griffin, ADF&G, personal communication). These vessels accounted for 88 percent of scallops landed. Based on their reported landings in 1994 and considering a closure in State waters as well, this would equate to a catch of approximately 1.1 million lb (490 mt) of shucked scallop meats. Using the 1994 average exvessel price of $6.00/lb and assuming that 14 percent of the total annual scallop landings would continue from State waters, this would equate to an annual forgone revenue of $5.7 million. An additional five vessels landed 0.1 million lb (45 mt) of shucked scallop meats equating to $0.52 million in 1992. This catch was from less than 1 percent to 46 percent of these vessels' landed catch of all species, including groundfish and crab. Taken together, closure of the EEZ, along with a concurrent closure of Alaskan State waters would result in those vessels forgoing revenue on the order of $6.2 million annually for the duration of the EEZ closure.

Options available to vessels which would not be able to scallop in the EEZ are limited. Beyond existing fisheries under Council management, the opportunities and capabilities of this fleet to engage in other fisheries imply a shift to one of several alternatives: (1) State-managed fisheries within Alaska; (2) state or federally managed fisheries in the United States outside Alaska; or (3) high-seas or foreign fisheries elsewhere in the world. Some of the vessels previously harvested scallops in the Atlantic Ocean, and may still qualify to scallop on the East Coast. Although many scallop vessels could be rigged to fish for groundfish, the opportunities for new vessels to participate in North Pacific fisheries are limited. The Council has adopted a moratorium on new vessels entering the groundfish and crab fisheries in the North Pacific.

Opportunities for new entrants in Alaska state-managed fisheries are restricted by the state's limited entry program that covers most of the important commercial fisheries, including salmon, sablefish, herring, and crab. In order to access most of these fisheries, new entrants from EEZ fisheries would have to purchase a permit, as well as adopt necessary vessel and gear modifications. In the case of salmon, asking prices for permits vary from around $50,000 up to over $250,000 for the most desirable areas. Salmon vessels in some areas have been developed to operate in specific regulatory and oceanographic conditions, such that halibut or groundfish boats may prove inadequate without modifications. The Alaska state fisheries are managed under a limited entry permit system because of existing concerns over excess capacity, such that the entry of vessels from Council-managed fisheries would require the exit of an existing vessel. In general, there appear to be few, if any, unexploited opportunities in existing state-managed fisheries that are capable of absorbing an influx of new entrants from the EEZ fisheries.

Outside domestic waters, fishing opportunities are less certain, although it is recognized that excess harvesting capacity exists for many of the world's developed fisheries. Following the extension of fisheries jurisdiction in the mid-1970s, most coastal nations--led by the United States--endeavored to claim the economic benefits associated with the marine resources in their exclusive economic zones, greatly reducing the opportunities for distant water fleets of some countries. As a result, access to the coastal waters of foreign nations must be arranged through joint venture arrangements, in competition with the distant water fleets of many other nations, such as Japan and Korea. However, the shift to foreign fisheries requires both logistical and diplomatic

arrangements that may be beyond the scope of many small boat operators. Also, opportunities for the Alaska fleet in foreign fisheries likely favor technologically advanced, higher valued vessels not readily available in the host country.

In summary, the problems associated with excess capacity and overcapitalization cannot be easily overcome by shifting unneeded vessels to other fisheries. This is not so much because of an incompatibility of technology, as the dilemma of widespread overcapitalization. Efficient, adaptable vessels are capable of shifting to other fisheries, and may well enter different fisheries in response to economic efficiency criteria. Entrepreneurs may also be capable of finding and competing in a variety of world-wide fisheries. Overall, however, there is no simple means of shifting excess Alaska EEZ vessels into other fisheries in the current environment, primarily because already there appears to be more than adequate capacity throughout the Alaskan, U.S. and world fishing industry.

There continues to be the possibility of a fishery for scallops in State waters. However, only about 14 percent of the resource was taken in State waters in 1994. Any State fishery would likely have to be of very short duration to prevent that portion of the State GHL from being exceeded.

Because of the longevity and low natural mortality associated with weathervane scallops, the yield from this fishery would essentially be recouped when the fishery is reopened, either 2 year after the proposed FMP goes into effect, or whenever the FMP is superseded by another FMP or amendment instituting a comprehensive management plan for scallops.

3.4 Administrative, Enforcement, and Information Costs and Benefits

Costs and benefits will depend on which alternative and option is being considered. Alternative 1, or the status quo, would incur costs to future fisheries due to overfishing of the resource. Alternative 3 also could result in costs to future fisheries if the regulatory hiatus that would occur under this alternative resulted in overfishing of scallop stocks. Alternatives 2 and 3 would result in varying amounts of cost to the Federal government. The significant cost categories for each alternative are discussed below.

Fisheries Management. Implementation of alternative 3, option 1 (preparation of a scallop FMP with regulations) would cost approximately $14,000.

The annual costs for in-season management of the scallop fishery requires real-time monitoring of catches, resulting in added management costs. For alternative 1, in-season management is deferred to the State. For alternative 3, in-season management costs would result from monitoring the scallop harvest, and computer programming for developing scallop reports and changing summary report forms. These costs would total approximately $12,000. Additional data entry work would also be required at $3,900.

Research. All of the alternatives, including the status quo, have information costs and benefits. State and Federal observers may be placed aboard scallop fishing and/or processing vessels to obtain, for example, catch and effort data; species, and size composition data. Observers may provide the benefits of better scientific and enforcement information than is otherwise available. The State is currently developing an industry funded observer program for scallop vessels. A scallop observer program may be funded by experimental fishing permit receipts, State of Alaska general fund appropriations, federal aid funds, research grants, or other sources.

The distribution, biomass, population dynamics parameters and the biological potential of the sea scallop resource are not yet well known. As such, it is important to conduct scientific research on the resource. Such research can be approached two ways: (a) conduct periodic surveys to estimate resource distribution and biomass; and (b) develop a biological sampling program to collect data from the commercial fishery to assess the abundance and

status of the resource. A good comprehensive survey of the sea scallop grounds in the GOA and the BSAI will require a 90-day cruise. Such a cruise cannot be part of ongoing groundfish research cruises because the type of sampling gear to be used will be different. A specialized scallop dredge will have to be used. The estimated cost of such a survey would be about $540,000 (assume a vessel charter with scientific personnel cost at $6,000 per day for a 90-day cruise). There would also be a need for data entry, data workup, and general staffing functions to make the information useable, estimated to be 1 staff-year.

A necessary part of the research program involves collection of fisheries statistics and biological specimens from the fisheries for status of stocks analyses. Assuming that a scientific observer program will already be in place and be paid for by the industry, the data collected will have to be analyzed by additional scientific personnel to determine the status of stocks. Determining the age of scallop specimens will have to be completed at the laboratory. All sources of data will need to be analyzed annually. The additional annual labor cost will be about $60,000 for 1.5 staff-years of time, adjusted for labor costs annually.

NMFS Enforcement. Enforcement costs are assumed to be minimal and that there will be few problems managing the scallop fishery with the entire EEZ closed to scallop fishing. Under full Federal management of scallops, enforcement costs are estimated at .75 to 1.0 agent/yr to address all violations. The estimated agent cost is $100,000/yr, and includes salary, equipment, travel, office space and support staff.

NOAA General Counsel. Costs for General Counsel to review proposed amendments to the GOA and BSAI FMPs or to review a proposed scallop FMP for submission to the Secretary would incur some cost. Prosecution or litigation that may ensue from the scallop regulations may also require additional costs.

Benefits

Maintenance of a viable scallop fishery under any of the alternatives will provide some benefit both the State and Federal governments through long-term employment.

3.5 Benefit-Cost Conclusion

There will be costs to fishermen who cannot operate in the scallop fishery. The Federal Government will incur cost associated with research and management of this fishery, and the magnitude of this cost depends on the alternative chosen. Benefits depend on the ability of the scallops stocks to maintain recruitment given the protection afforded by Federal management.

Under alternative 2, closure of Federal waters off Alaska to fishing for scallops could result in total foregone revenues that approach $6.2 million during the one-year effective period of the closure. The short-term foregone revenue is necessary to protect scallop stocks from overfishing during the period of time an FMP is prepared that the provides the management measures necessary for a controlled fishery in Federal waters. The long-term gain under alternative 2 would result from maintaining a healthy scallop resource with a sustainable productivity to support the harvest of optimum yield on a continuing basis once Federal waters are opened to fishing for scallops under a future FMP. Based on recent harvest levels and exvessel prices, this could reach $6 million annually.

Permanent or interim fishing for scallops under a regulatory void, as would occur under alternatives 1 or 3, respectively, would result in short term gains that could approach $ 6 million annually. Long term losses would be expected, however, as localized overfishing of scallop stocks reduced harvest and revenue amounts in the fishery. This cycle of "boom and bust" has been previously observed in the Alaska scallop fishery and would be expected to occur again under either of these alternatives.

3.6 Impact of the Proposed Action Relative to E.O. 12866 Requirements

None of the proposed alternatives is expected to result in a "significant" regulatory action as defined in E.O. 12866.

The proposed regulatory amendment would not create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.

The proposed regulatory amendment would not materially alter the budgetary impacts of entitlements, grants, user fees, or loan programs or the rights and obligations of the recipients thereof.

The proposed regulatory amendment would not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in Executive Order 12866.

The proposed regulatory amendment would not have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, productivity, competition, jobs, the environment, the public health or safety, or governments.

4.0 IMPACT OF THE PROPOSED ACTION RELATIVE TO THE RFA

The objective of the Regulatory Flexibility Act is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. If an action will have a significant impact on a substantial number of small entities, an Initial Regulatory Flexibility Analysis (IRFA) must be prepared to identify the need for the action, alternatives, potential costs and benefits of the action, the distribution of these impacts, and a determination of net benefits.

NMFS has defined all fish-harvesting or hatchery businesses that are independently owned and operated, not dominant in their field of operation, with annual receipts not in excess of $2,000,000 as small businesses. In addition, seafood processors with 500 employees or fewer, wholesale industry members with 100 employees or fewer, not-for-profit enterprises, and government jurisdictions with a population of 50,000 or less are considered small entities. A "substantial number" of small entities would generally be 20% of the total universe of small entities affected by the regulation. A regulation would have a "significant impact" on these small entities if it resulted in a reduction in annual gross revenues by more than 5 percent, annual compliance costs that increased total costs of production by more than 5 percent, or compliance costs for small entities that are at least 10 percent higher than compliance costs as a percent of sales for large entities.

If an action is determined to affect a substantial number of small entities, the analysis must include:

(1) a description and estimate of the number of small entities and total number of entities in a particular affected sector, and total number of small entities affected; and

(2) analysis of economic impact on small entities, including direct and indirect compliance costs, burden of completing paperwork or recordkeeping requirements, effect on the competitive position of small entities, effect on the small entity's cashflow and liquidity, and ability of small entities to remain in the market.

The objective of the Regulatory Flexibility Act (RFA) is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. If an action will have a significant impact on

a substantial number of small entities an IRFA must be prepared to identify the need for the action, alternatives, potential costs and benefits of the action, the distribution of these impacts, and a determination of net benefits.

Most commercial fishing vessels harvesting scallops off Alaska meet the definition of a small entity under the RFA. The potential short-term forgone revenue that would occur under Alternative 2 (the preferred alternative) would result in a significant economic impact on a substantial number of small entities. These impacts, as well as those under Alternaives 1 and 3, have been detailed in previous sections.

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7.0 LIST OF FIGURES

Figure 1. Scallop landings in Alaska, 1969-1992.

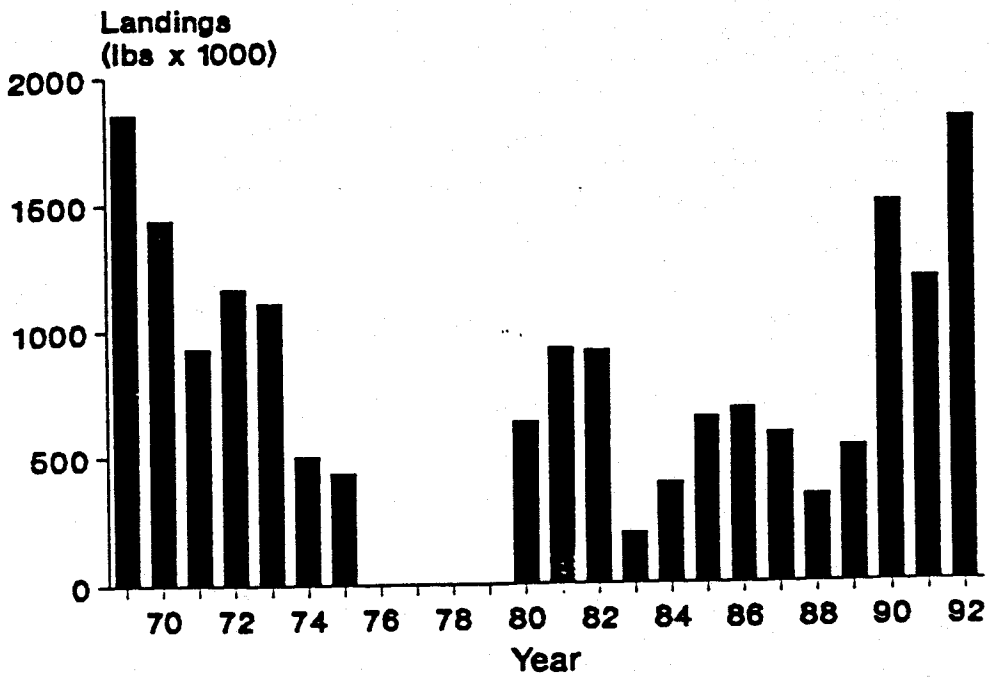
Figure 2. Scallop landings inside and outside Alaskan State waters by management area, 1969-1991.

Figure 3. Scallop dredge design used in the U.S. east coast and Alaska sea scallop fisheries.

Figure 4. Size frequency of scallops caught in the Yakutat, Prince William Sound, and Kodiak Management Areas during the 1993 scallop fishery. From Urban et al. (1994).

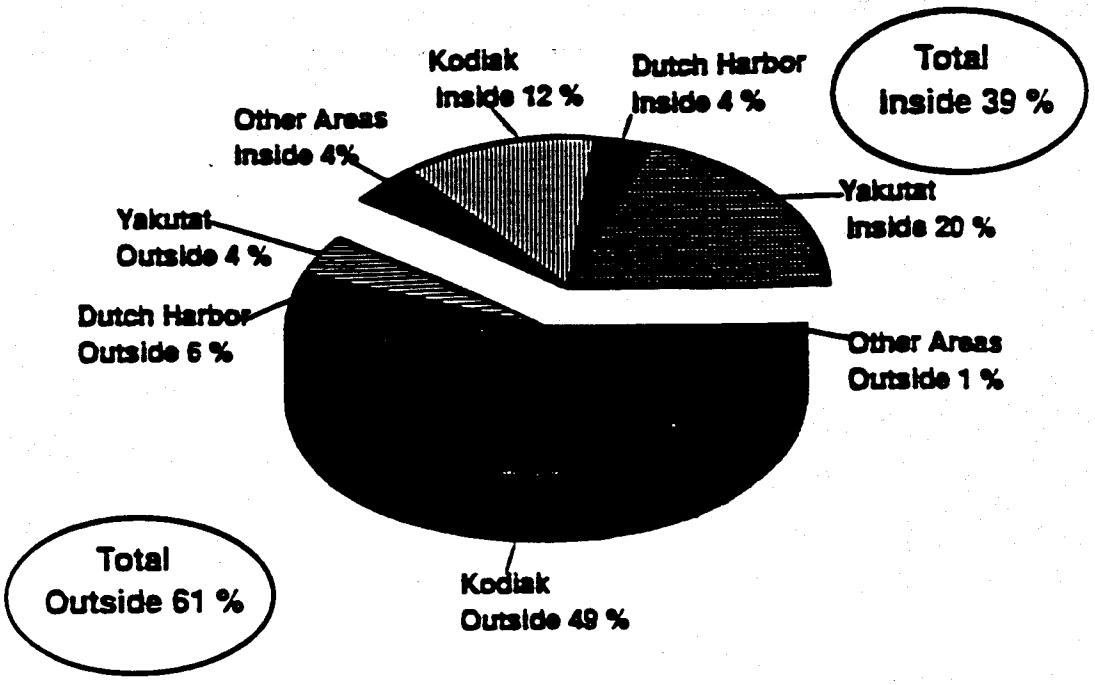
Figure 5. Size frequency of scallops caught in the Alaska Peninsula, Dutch Harbor, and Bering Sea Management Areas during the 1993 scallop fishery. From Urban et al. (1994).

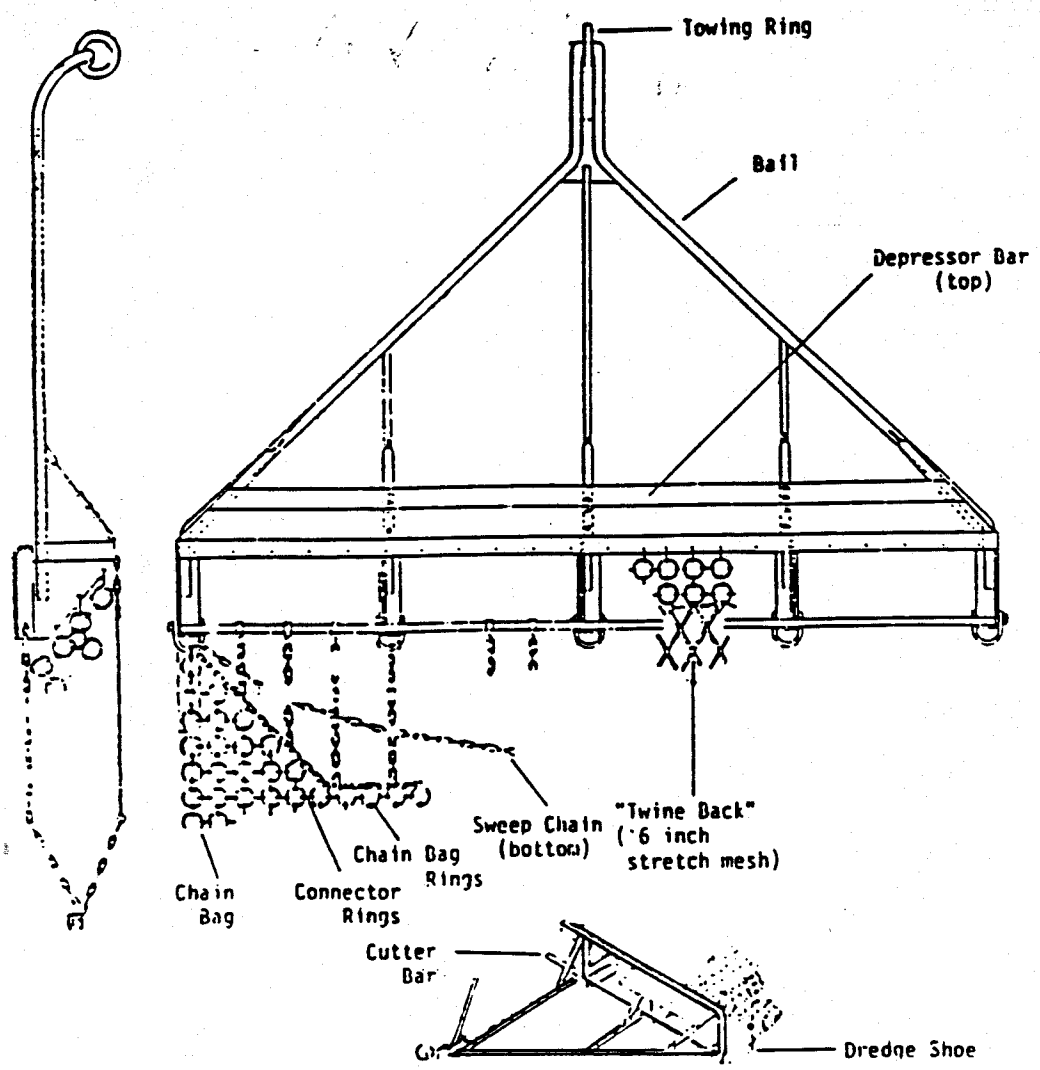
Figure 1. Scallop landings in Alaska, 1969-1992.



Data for 1976-1979 are confidential.

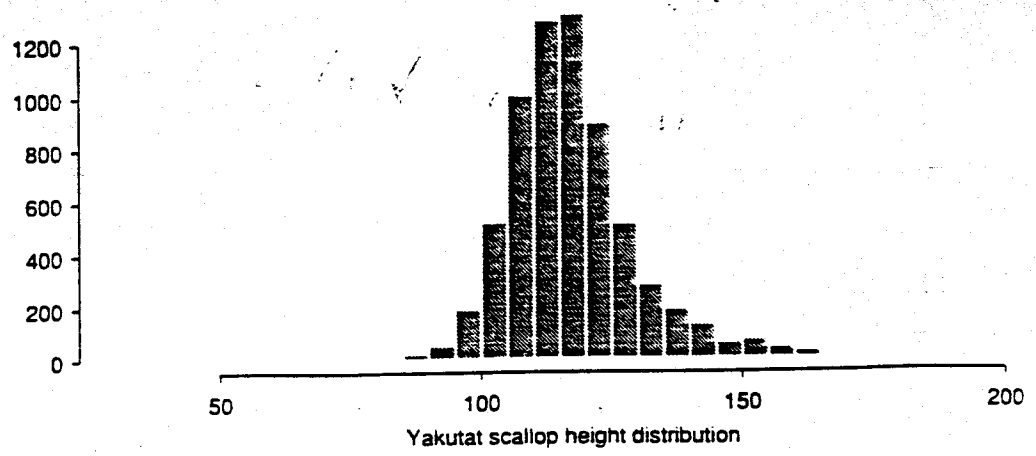
Figure 2. Scallop landings inside and outside Alaskan State waters by management area. 1969-1991.

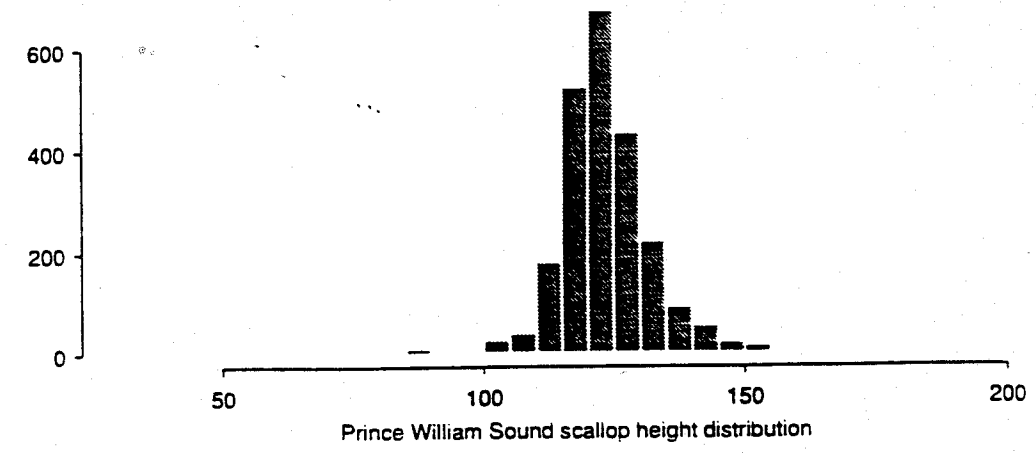




Source: Food and Agriculture Organization (UN), 1972

Figure 3. Scallop dredge design used in the U.S. east coast and Alaska sea scallop fisheries.





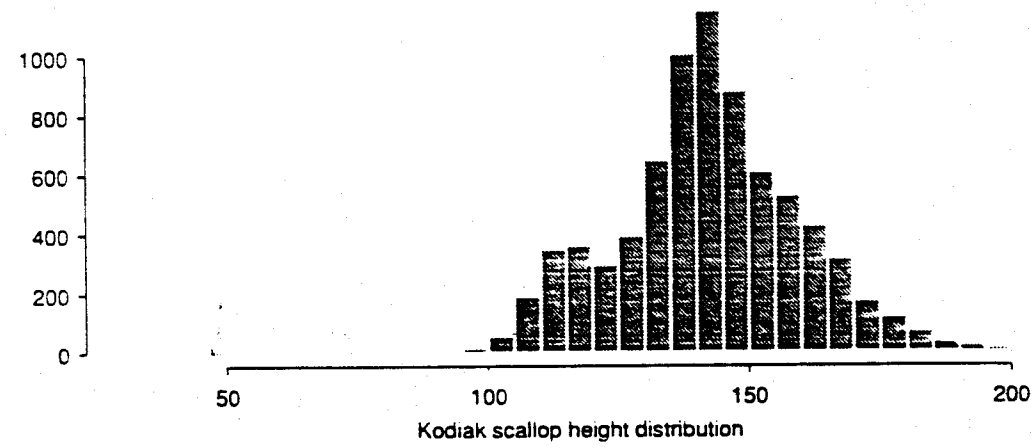


Figure 4. Size frequency of scallops caught in the Yakutat, Prince William Sound, and Kodiak Management Areas during the 1993 scallop fishery. From Urban et al. (1994).

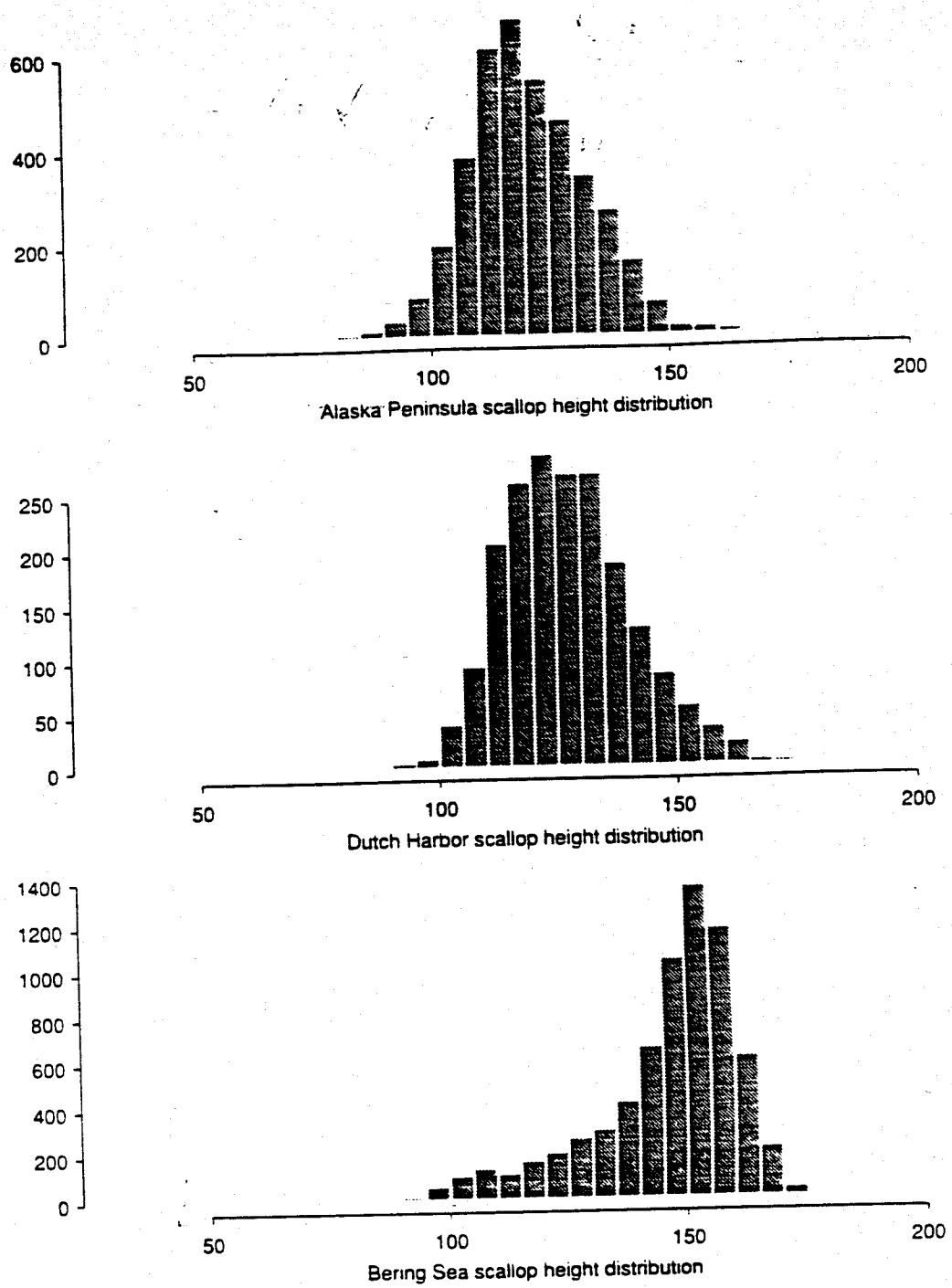


Figure 5. Size frequency of scallops caught in the Alaska Peninsula, Dutch Harbor, and Bering Sea Management Areas during the 1993 scallop fishery. From Urban et al. (1994).

APPENDIX A. DEFINITIONS OF TERMS

The following terms are used extensively throughout this document:

Acceptable biological catch (ABC) is a seasonally determined catch or range of catches that may differ from MSY for biological reasons. It may be lower or higher than MSY in some years for species with fluctuating recruitment. Given suitable biological justification, the ABC may be set anywhere between zero and the current harvestable biomass. The ABC is defined as zero when the stock is at or below threshold. The ABC may be modified to incorporate safety factors and risk assessment due to uncertainty. Lacking other biological justification, the ABC is defined as the MSY exploitation rate multiplied by the size of the biomass for the relevant time period. This definition of ABC differs slightly from other FMPs, in that others specify that the upper end of the range for ABCs is current biomass less threshold.

Commercial fishing means fishing, the resulting catch of which is intended to be sold or bartered.

Federal is defined as the United States Federal Government. Federal fisheries management falls within the Department of Commerce, with the primary regulatory agency for fishing as the National Marine Fisheries Service within the National Oceanic and Atmospheric Administration. The North Pacific Fishery Management Council provide local and regional input on fishery management to the Secretary of Commerce on

Fishing year is a calendar year used for accounting and tax purposes. It is defined as January 1 through December 31.

Guideline harvest level (GHL) is the proposed level of harvest that is less than or equal to ABC, established preseason, and usually expressed as a range of allowable harvest for a species or species group of scallops for each registration area, district, subdistrict or section. The sum of GHLs represent the allowable catch within the OY range.

Guideline Harvest Range (GHR) is the proposed range for the annual GHL of each registration area, district, subdistrict or section. The GHRs are established on the basis of pounds of shucked meats, and are estimated using the best available scientific information. GHRs may be revised as new biological and fishery data become available.

Maximum sustainable yield (MSY) is an average over a reasonable length of time of the largest catch which can be taken continuously from a stock under current environmental conditions. MSY should normally be presented with a range of values around its point estimate. Where sufficient scientific data as to the biological characteristics of the stock do not exist, or the period of exploitation or investigation has not been long enough for adequate understanding of stock dynamics, the MSY will be estimated from the best information available. This definition adopted by the Council's Scientific and Statistical Committee (SSC) is similar to a definition presented in Ricker (1975).

Optimum Yield (OY) is that which provides the greatest overall benefit to the nation with particular reference to food production and recreational fisheries. OY is based upon the maximum sustainable yield for a given fishery, modified by relevant economic, social or biological factors. It may be obtained by a plus or minus deviation from ABC for purposes of promoting economic, social or ecological objectives as established by law and the public participation process.

The definition of OY prescribes that the benefits of the fishery resources be allocated among all of the people affected by the fishery. These include commercial fishermen, processors, foreign fishermen, sport fishermen, distributors, consumers, governments, and a host of manufacturing and service industries. These groups usually

have different and often conflicting ideas about the best use of the resources. Optimum yield then involves judgmental decisions that must be made by Councils based upon the best obtainable information.

Recruitment overfishing is the condition that occurs when the spawning stock is reduced by fishing to too low a level to ensure adequate production of young scallops -- the recruits to the future fishery. This definition is modified from Gulland (1983).

Registration (statistical) area. According to the State regulations, a statistical area consists of a registration area comprising all the waters within the statistical area which are territorial waters of Alaska; and an adjacent seaward biological influence zone, comprised of all the waters within the statistical area which are not part of the registration area. For this FMP, the term registration area shall encompass the statistical area.

Registration year is defined as January 1 through December 31.

State is defined as the State of Alaska. There are several agencies within the State (in addition to the State legislature) that regulate fisheries, fish processing, and habitat protection, including the Alaska Board of Fisheries (BOF), the Alaska Department of Fish and Game (ADF&G), the Commercial Fisheries Entry Commission (CFEC), and the Alaska Department of Environmental Conservation (ADEC).

Subsistence fishing means the taking of scallops for customary and traditional uses by Alaska residents for direct personal or family consumption and not for sale in accordance with applicable law.

Threshold is the minimum size of a stock that allows sufficient recruitment so that the stock can eventually reach a level that produces MSY. Implicit in this definition are rebuilding schedules. They have not been explicitly specified since the selection of a schedule is a part of the OY determination process. Interest instead is on the identification of a stock level below which the ability to rebuild is uncertain. When a stock is at or below threshold, the fishery will be closed entirely, because further removals from the spawning stock will further jeopardize the already uncertain ability of the stock to recover. The estimate given should reflect use of the best scientific information available (see Guideline Harvest Levels). This threshold definition differs only slightly from those used in other FMPs. The primary distinction is the specification that the fishery will be closed when the stock is at or below threshold. However, this addition is made only for clarity, and is consistent with the range of harvests specified in the definition of ABC below.

APPENDIX B. APPLICABLE MANAGEMENT INSTITUTIONS, LAWS, AND POLICIES

B.1 State Management Agencies

Alaska Board of Fisheries

The Alaska Board of Fisheries (BOF) is responsible for regulating harvest through seasons, quotas, bag limits, harvest levels, sex and size limitations, area closures, and gear restrictions. The BOF also makes allocative decisions concerning various fisheries in the State. The Board works closely with the Alaska Department of Fish and Game.

Alaska Department of Fish and Game

The Alaska Department of Fish and Game (ADF&G) provides for protection, rehabilitation, propagation, preservation, and investigation of fish and game resources throughout the State. For fisheries, ADF&G's primary responsibility is to ensure that sustainable yields for fish stocks are not exceeded, and can make in-season changes to regulations required to achieve this goal. ADF&G provides licensing, enforcement, and research necessary for management of state fisheries. State regulations affecting the scallop fishery are attached in the Appendix section of this document.

Alaska Department of Environmental Conservation

The Alaska Department of Environmental Conservation (ADEC) is responsible for ensuring environmental quality of air, land, and water within the State of Alaska. This agency regulates and monitors the quality of commercially harvested and processed fish products. ADEC currently defines shellfish as clams, oysters, and mussels, both fresh and frozen, and requires that shellfish be taken from approved areas, and requires records and labels for monitoring purposes.

B.2 Federal Management Agencies

Regional Fishery Management Council

The North Pacific Fishery Management Council, under the Magnuson Act, is charged with preparing fishery management plans for fisheries within the EEZ off the Alaska coast. The Council prepares plans that cover foreign and domestic fishing, and submits them to the Secretary of Commerce for approval and implementation. Once implemented, it is the responsibility of the National Marine Fisheries Service (NMFS) and the U.S. Coast Guard to enforce the laws and regulations.

Pacific States Marine Fisheries Commission

The Pacific States Marine Fisheries Commission's Interstate Fishery Management Program was initiated through a cooperative agreement with the NMFS in 1980 and promotes cooperative management of marine, estuarine, and anadromous fisheries in west coast state waters. This program determines priorities for territorial sea fisheries management; develops, maintains, and reviews management plans for high priority fisheries; recommends to states, regional fishery management councils, and provides a means of conducting short-term research to facilitate preparation or review of fishery management plans.

National Marine Fisheries Service

NMFS, under the National Oceanic and Atmospheric Administration (NOAA), collects commercial and recreational fishery statistics, develops fish stock assessments, and provides technical expertise to facilitate the regional councils' conservation and management of fisheries through the development of fishery management plans. NMFS responsibilities also include habitat, marine mammals, and endangered species. NMFS shares responsibility for enforcing Magnuson Act regulations with the U.S. Coast Guard.

U. S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service, under the Department of Interior, manages fish pursuant to the Endangered Species Act and the Fish and Wildlife Coordination Act. They review and comment on proposed activities affecting navigable waters that are sanctioned, permitted, assisted, or conducted by Federal agencies, focusing on impacts to fish, wildlife, and the habitat on which they depend.

Environmental Protection Agency

The Environmental Protection Agency regulates the discharge of pollutants into marine waters. Certain standards must be met before a National Pollutant Discharge Elimination System permit will be issued by the agency.

Corps of Engineers

The U.S. Army Corps of Engineers (COE), pursuant to the Clean Water Act, regulates the disposal of dredged material. A number of state and Federal agencies comment on proposed projects which are considered by COE before issuing permits.

United States Coast Guard

The U.S. Coast Guard shares the responsibility for enforcing regulations promulgated pursuant to the Magnuson and Lacey Acts with NMFS.

B.3 Federal Laws, Regulations, and Policies

Implementation of the preferred alternative would be conducted in a manner consistent, to the maximum extent practicable, with all applicable laws and their implementing regulations.

Magnuson Fishery Conservation and Management Act of 1976

The Magnuson Act provides a national program for the conservation and management of fisheries to allow for optimum yield (OY) on a continuing basis and to realize the full potential of the nation's fisheries resources. Under the Act, eight Regional Fishery Management Councils are charged with preparing fishery management plans for the fisheries within their areas of management authority. The Councils prepare management plans that cover foreign and domestic fishing and submit them to the Secretary of Commerce for approval and implementation. Once implemented, it is the responsibility of the NMFS and the U.S. Coast Guard to enforce the laws and regulations.

Marine Protection, Research, and Sanctuaries Act of 1972

The Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C. 1431-1434) authorizes the Secretary of Commerce to designate as marine sanctuaries those areas of ocean waters within U.S. jurisdiction determined to be necessary for preserving or restoring their conservation, recreational, ecological, or esthetics values. On November 7, 1988 this Act was amended and re-authorized through 1992 by PL 100-627.

Oil Pollution Act of 1961

The Oil Pollution act regulates intentional discharge of oil or oily mixtures from ships registered in the U.S. and thus provides some degree of protection to fishery resources. Tankers cannot discharge oil within 92 km (50 nm) of the nearest land. Ships other than tankers must discharge as far as practicable from land. The quantity of oil which can be discharged is also regulated.

Coastal Zone Management Act

The Coastal Zone Management Act of 1972 (16 U.S.C. 1451) establishes a national policy placing responsibility for comprehensive land and water management of the coast zone upon the coastal states. Federal actions directly affecting a state's coastal zone must be as consistent as possible with approved state coastal zone management plans.

Endangered Species Act of 1973

The Endangered Species Act provides for the listing of plant and animal species as threatened or endangered. The taking or harassment of listed species is prohibited. The Act establishes a process which seeks to ensure that projects authorized, funded, or carried out by Federal agencies do not jeopardize the existence of these species or result in destruction or modification of habitat determined by the Secretary to be critical.

National Environmental Policy Act

The National Environmental Policy Act requires that Federal agencies prepare environmental impact statements prior to undertaking major activities which might significantly affect the quality of the human environment. These impact statements are to evaluate any alternative to the proposed action which may better safeguard environmental values.

Fish and Wildlife Coordination Act

Under the Fish and Wildlife Coordination Act, the U.S. Fish and Wildlife Service and the NMFS review and comment on fish and wildlife aspects of proposals by Federal agencies which take place in or affect navigable waters. The review focuses on potential damage to fish and wildlife and their habitat.

Fish Restoration and Management Projects Act

The Fish Restoration and Management Projects Act appropriate funds to state fish and game agencies for fish restoration and management projects. Additional funds for the protection of threatened fish communities located within state waters, including marine areas, could be made available under the Act.

Lacey Act Amendment of 1981

The Lacey Act Amendment of 1981 strengthen and improve enforcement of Federal fish and game laws and provides Federal assistance in enforcement of state laws. The Act prohibits import, export, and interstate transport of illegally taken fish or wildlife.

Commercial Fishing Industry Vessel Liability Act 1987

The Commercial Fishing Industry Vessel Compensation and Safety Act establishes guidelines for timely compensation for temporary injury by seamen on fishing vessels.

Plastics Pollution Research and Control Act (MARPOL Annex 5)

The Marine Plastics Pollution Research and Control Act of 1987 implements Annex V of the International Convention for the Prevention of Pollution by Ships and prohibits all vessels, including commercial and recreational fishing vessels, from discharging plastics in U.S. waters and severely limits the discharge of other types of refuse at sea. This legislation also requires ports and terminals receiving these vessels to provide adequate facilities for in-port disposal of non-degradable refuse, as defined in the Act.

Clean Water Act & Water Quality Act of 1987

The Clean Water Act requires that a National Pollutant Discharge Elimination System permit be obtained before any pollutant is discharged from a point source into U.S. waters. Issuance of this permit is based primarily on the effluent guidelines found in 40 CFR 435. However, additional conditions can be imposed on permit issuance on a case by case basis to protect valuable resources in the discharge area (Department of Commerce 1987).

The Water Quality Act of 1987 re-authorized and amended the Clean Water Act. The amendment requires the Environmental Protection Agency to identify and establish numerical limits for each toxic pollutant in sewage sludge and establish management practices to achieve the set limits.

The National Aquaculture Improvement Act of 1985

The intent of the National Aquaculture Act, is to stimulate development of the domestic aquaculture industry, replenish depleted fisheries, and reduce the trade deficit in fishery products.

The Marine Mammals Protection Act Amendments of 1988

The Marine Mammals Protection Act of 1982 prohibited the taking of marine mammals incidental to commercial fishing unless authorized by a general incidental take permit or a small take exemption. On November 23, 1988, PL 100-711 was signed into law re-authorizing and amending the act. The Amendment replace existing provisions for granting incidental take authority by commercial fishermen with an interim exemption system valid until October 1, 1993. Exemptions are available only to U.S. vessels or foreign vessels with valid fishing permits issued under Section 204(b) of the Magnuson Act.

B.4 International Management, Treaties, and Agreements

International Pacific Halibut Commission

The International Pacific Halibut Commission (IPHC), originally called the International Fisheries Commission, was established in 1923 by a Convention between Canada and the United States. Under the current Halibut Treaty, IPHC has jurisdiction over the Canadian and United States setline fishery for halibut and can prohibit retention of incidentally caught halibut in other fisheries, but has no jurisdiction to limit the incidental catch of halibut by foreign or domestic fisheries. Bycatch of halibut in the scallop fisheries would be regulated by the North Pacific Fishery Management Council.

Convention of the Continental Shelf

Foreign fishing is prohibited within the EEZ for anadromous species and continental shelf fishery resources beyond the EEZ out to the limit of United States jurisdiction under the Convention of the Continental Shelf unless authorized by an international agreement which existed prior to passage of the Magnuson Act and is still in force and effect or authorized by a Governing International Fishery Agreement which has been issued subsequent to the Magnuson Act.